THE EFFECTS OF IMPLICIT THEORIES OF EMOTION ON EMOTION REGULATION AND EXPERIENCE

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DISSERTATION ABSTRACT

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Title: The Effect of Implicit Theories of Emotion on Emotion Regulation and Experience

This dissertation examined the effects of implicit theories of emotion—beliefs about the malleability of emotion—on emotion regulation and experience. Incremental theories involve beliefs that emotions are controllable; entity theories involve beliefs that emotions are uncontrollable. I hypothesized that an incremental theory would be associated with better well-being, more adaptive emotion regulation, and mastery-oriented patterns of response to emotion regulation difficulty, compared to an entity theory. Study 1 developed a valid and reliable questionnaire to assess trait implicit theories of emotion and examined correlations with self-reports of personality, emotional experience, emotion regulation, and well-being. A trait incremental theory was associated with greater positive emotion and less negative emotion, an effect that was mediated by the tendency of incremental theorists to use more active coping and adaptive emotion regulation strategies, compared to entity theorists. Incremental theories were also associated with greater overall well-being, lower depression, and less stress. Studies 2-5 manipulated implicit theories of emotion and examined their causal effects on emotion and emotion regulation. Although entity and incremental participants did not report differences in emotional experience when experiencing emotions naturally (Study 2), participants in the incremental group were more likely to regulate their emotions when

explicitly asked to do so (Study 3). Specifically, only incremental participants responded to instructions to remain objective while rating emotionally evocative images. Studies 4 and 5 examined differences in reactions to emotion regulation difficulty. After completing an "emotional interference" task, all (Study 4) or a random half (Study 5) of participants were told that they had done poorly and rated attributions for their performance, affect, and motivation to remain engaged versus withdrawing. Although hypothesized patterns did not emerge as a whole, participants in the incremental condition were more likely to attribute their performance (failure or success) to strategy use. This research has implications for the study of emotion regulation, in particular, patterns of helplessness and mastery within the domain of emotions.

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CHAPTER I

GENERAL INTRODUCTION

Introduction

People can have very different beliefs about the nature of emotions. One person could see emotions as passions that arise quickly and automatically, that override reason and compel (sometimes inappropriate) action, and that leave them helpless and passive. Another person could see emotions as dynamic processes that serve essential functions in everyday life, from maintaining interpersonal relationships to encouraging personal growth, as long as they are managed in an appropriate manner. Such beliefs about emotion are likely to influence how people experience emotion. Someone who subscribes to the first set of beliefs might try to avoid emotions in general, make half-hearted attempts to manage them when they do arise, and experience them in a way that threatens well-being. On the other hand, someone who subscribes to the second set of beliefs might be able to cultivate a healthy repertoire of ways to flexibly manage their emotions, and experience them in a way that promotes general well-being.

The purpose of this research was to examine how beliefs about emotions influence how people experience them. I focused on implicit theories of emotions—beliefs about the extent to which emotions can be changed or controlled—and the effects those beliefs have on emotion regulation—the ways in which people try to change or influence their emotions. In investigating this question, I aimed to address why some people are more effective at regulating their emotions than others, which has important implications for subjective and psychological well-being.

In examining these processes, I drew from research on academic achievement, the domain that has received the most attention within the implicit theories framework. Extensive research has demonstrated that beliefs about the malleability of intelligence influence how people interpret and respond to important events and transitions in school. I therefore first review the literature on patterns of response to failure in the academic domain, and the research that shows how these patterns stem from beliefs about the nature of intelligence (see Dweck, 1999; Dweck & Leggett, 1988). I then turn to the domain of emotions, examining parallels between success and failure in academic achievement and success and failure in emotion regulation. I review the existing research on implicit theories of emotion, and raise several questions that deserve empirical attention. I conclude the introduction by setting four primary goals for this dissertation.

Helpless- and Mastery-Oriented Patterns of Response

In the 1970's, Carol Dweck identified a subset of schoolchildren who responded to academic challenges with utter helplessness: Upon encountering failure, they experienced intense distress, withdrew effort, and avoided opportunities to improve their skills if it meant that they would continue to perform poorly (Diener & Dweck, 1978; Dweck & Reppucci, 1975). In contrast, another subset of children responded to academic failure with a mastery-oriented pattern: They maintained task engagement and did not experience the intense distress that helpless children did, in part because they did not view challenge as a sign of failure, but rather as an indication that they should increase their effort or change their strategies (Diener & Dweck, 1978). Dweck found that the helpless children were less likely to take personal responsibility for the outcomes of their work, and attributed both their failures and successes to uncontrollable factors such as a

fixed ability level. In contrast, mastery-oriented children were more likely to take personal responsibility for both successes and failures, and attributed academic outcomes to controllable factors such as effort (Dweck & Reppucci, 1974).

These helpless- and mastery-oriented patterns of thoughts, affect, and motivation are most influential when a child faces failure or challenge (Dweck & Leggett, 1988). Why was challenge so much more powerful for some children than for others? According to Dweck's model, beliefs about the nature of intelligence guide students' goals and their perception of success and failure (Dweck & Leggett, 1988). Poor performance means something different, depending on whether a person believes that intelligence is fixed or malleable (Molden & Dweck, 2006).

Implicit Theories: Entity and Incremental Beliefs

Implicit theories (sometimes referred to as "mindsets") refer to personal beliefs about the malleability of psychological attributes (Dweck & Leggett, 1988). According to an entity theory, the attribute (e.g., intelligence) is fixed and cannot be changed. According to an incremental theory, the attribute is malleable and can be changed—improved or modified—through hard work. These beliefs are implicit because people are often not aware of them explicitly, though they influence various aspects of our lives.

Implicit Theories of Intelligence

The extensive research on implicit theories of intelligence in children and in young adults has demonstrated how pervasive the effects of holding an entity or incremental theory can be. Because entity theorists believe intelligence is fixed, they seek to prove that they are intelligent, or at least not unintelligent (Elliot & Dweck, 1988; Robins & Pals, 2002). Their self-esteem is contingent on performing well: Failure

indicates low ability, and introduces a range of cognitive, emotional, and motivational deficits that form the helpless pattern (Dweck, 1999; Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999). Specifically, entity theorists are more likely to attribute failure to external, uncontrollable sources, more likely to experience intense negative affect in response to failure, and less likely to take action that could improve their performance (Hong et al., 1999; Robins & Pals, 2002).

In contrast, incremental theorists are more likely to display a mastery-oriented pattern. Because their self-esteem is not contingent on success, they show more adaptive responses to failure: Incremental theorists are more likely to attribute failure to internal, controllable factors such as insufficient effort or an inappropriate strategy (Hong et al., 1999; Robins & Pals, 2002). They are less likely to experience the intense negative affect that entity theorists face upon failure, and are more likely to change their strategy or increase effort (Hong et al., 1999; Dweck, 1999). Because they believe intelligence is malleable, they are more likely to seek to improve their skills, even at the risk of performing poorly for the moment (Elliot & Dweck, 1988; Robins & Pals, 2002).

These beliefs and response patterns have real-life implications: Whereas entity theorists risk declining performance over the course of important academic transitions such as to junior high (Blackwell, Trzesniewki, & Dweck, 2007) and to college (Robins & Pals, 2002), incremental theorists are more likely to stay engaged, increase their effort, and try out new strategies, which ultimately helps them maintain or improve their performance.

Implicit Theories in Other Domains

In addition to intelligence, individuals also differ in their implicit theories of personality (Chiu, Hong, & Dweck, 1997), morality (Chiu, Dweck, Tong, & Fu, 1997), and shyness (Beer, 2002). Beliefs about such attributes are called "self-theories" (Dweck, 1999), because they refer to beliefs about the malleability of one's own attributes (e.g., whether you can increase your own intelligence or change your own personality).

The model can also be applied to external phenomena as well. For example, if a person views the world as malleable, he or she will be more active in trying to improve it, whereas if a person views the world as stable, he or she will try to understand and predict it, but not change it (Dweck et al., 1995). In romantic relationships, a destiny belief (analogous to an entity theory) is a belief that relationship partners are either compatible or not, whereas a growth belief (analogous to an incremental theory) is a belief that relationships grow with time and experience (Knee, 1998). People with destiny beliefs are oriented toward evaluation. In their constant search for evidence of compatibility, relationship difficulties indicate that the relationship may not be viable. People with growth beliefs are oriented toward cultivation, and see difficulties are a normal part of relationships, offering a chance for improvement (Knee, Patrick, & Lonsbary, 2003). Although both beliefs can be adaptive within a relationship, they have different implications for how people deal with conflict: Growth beliefs encourage relationship partners to work through their problems, whereas destiny beliefs encourage people to disengage from problematic relationships or situations (Knee et al., 2003).

In summary, across several domains, the research on implicit theories suggests that if a person perceives an attribute as fixed and uncontrollable, he or she is more likely

to experience greater distress upon encountering a challenge and more likely to display a helpless pattern. In contrast, if a person perceives an attribute as malleable and controllable, he or she is less likely to experience distress and more likely to display a mastery-oriented pattern. Applying the implicit theory framework to emotions may explain why some people are more active and successful in managing their emotions than others.

Helpless- and Mastery-Oriented Emotion Regulation

Helplessness and Mastery in Emotion Regulation

The term emotion regulation refers to the processes by which people influence their experience and expression of emotion (Gross, 1998b). Emotion regulation encompasses a wide range of goals and methods (Koole, 2009). It can involve increasing, maintaining, or decreasing the experience or expression of either positive or negative emotions (Parrott, 1993). It can involve maximizing pleasure and minimizing pain, or using one's emotions in such a way as to serve one's goals (Tamir, 2009b). Strategies vary in their effectiveness, and people vary in the strategies they habitually employ (e.g., Carver, Scheier, & Weintraub, 1989; Gross & John, 2003, Nolen-Hoeksema, 1991).

One example of a generally effective strategy is cognitive reappraisal, in which a person attempts to change the way he or she feels by changing the way he or she thinks (Gross, 1998a; Gross & John, 2003). Because it occurs early in the emotion generation process, successful reappraisal can prevent a full-blown emotion or reduce its intensity, at relatively low cognitive and physiological costs, compared to, for example, suppressing one's expression of emotion, which occurs later in the emotion generation process (Gross, 1998a; Gross & John, 2003). Reappraisal is also flexible, in that it can be used to

decrease or increase negative or positive emotion. One example of a generally ineffective strategy is rumination, in which a person dwells on his or her negative feelings and considers the causes and consequences of a negative event, without attempting to actively solve the problem (Nolen-Hoeksema, 1991). Rumination has been linked to depression, negative thinking, and inhibition of active problem solving (Nolen-Hoeksema, Lyubomirsky, & Wisco, 2008).

Why would a person use an ineffective strategy for regulating their emotions? I propose that relying on ineffective strategies such as rumination reflects a helpless pattern that emerges because a person believes that emotions are not changeable. In contrast, a mastery-oriented pattern consists of a repertoire of flexible, effective strategies that emerges from a belief that emotions are changeable, which encourages effort, practice, and development of successful strategies and abandonment of unsuccessful ones.

Implicit Theories of Emotion

Initial research shows that people vary in their implicit theories of emotion: Entity theorists believe emotions are fixed and unchangeable, and incremental theorists[1] believe emotions are malleable and controllable (Tamir, John, Srivastava, & Gross, 2007). In a longitudinal study of the transition to college, Tamir and colleagues found that incremental theories of emotion, measured before students started college, predicted more positive emotion, less negative emotion, and increasing social support during and after the first term of college. At the end of the year, students with stronger incremental

[1] Because individual differences in implicit theories of emotion are measured continuously, when describing trait-level implicit theories, the phrase "incremental theorist" refers to someone who scores higher on beliefs favoring emotion malleability, whereas "entity theorist" refers to someone who scores lower.

emotion theories reported fewer depressive symptoms and higher psychological well-being (broadly defined), compared to those who had stronger entity theories. The researchers also found that implicit theories correlated with greater habitual use of cognitive reappraisal, and that the relationships between implicit theories of emotion and emotional outcomes were mediated by emotion regulation self-efficacy: People who had stronger incremental theories were more confident in their ability to regulate their emotions, which in turn predicted actual emotional experience (Tamir et al., 2007).

How can beliefs about emotions influence emotion regulation? One possibility is that beliefs about the controllability of emotions are related to the initiation of emotion regulation—only those who believe emotions are controllable will be likely to initiate emotion regulation, whereas those who believe emotions are uncontrollable do not bother to try (Tamir & Mauss, 2011). In modern society, however, emotions rarely go unregulated (Cole, Michel, & Teti, 1994). A second possibility is that entity theorists do not simply allow their emotions to unfold unregulated, but rather they rely on different techniques because they have different ideas about what emotions are and what emotion regulation entails.

For an incremental theorist, emotions are a normal part of everyday life, and because they can be changed, they do not necessarily threaten well-being. Emotion regulation may mean choosing from among the most appropriate strategies—the ones that are most likely to be effective within a given context—and changing emotions (or not) in an appropriate way. For an entity theorist, emotions, especially negative ones, threaten well-being, and should therefore be avoided. When an emotion does occur, rather than trying to change it, an entity theorist may dwell on his or her feelings in an

attempt to understand or predict them (see Dweck et al., 1995). In other words, emotion regulation may mean something different, depending on a person's understanding of emotions (Molden & Dweck, 2006).

To date, the study by Tamir and colleagues (2007) is the only published research on implicit theories of emotion. Numerous methodological and theoretical questions regarding the construct of implicit theories of emotion, and how implicit theories of emotion might influence emotional experience and well-being remain unanswered.

From a methodological standpoint, how should we measure and manipulate implicit theories? Tamir and colleagues (2007) used a 4-item questionnaire to assess implicit theories of emotions in general. Do these beliefs refer mostly to negative emotions, positive emotions, or both? Can we manipulate implicit theories of emotion, as researchers have manipulated implicit theories in other domains (e.g., Hong et al., 1999), to investigate how implicit theories of emotion influence emotional experience and emotion regulation?

From a theoretical standpoint, we need to better understand implicit theories of emotion and how they are related to other constructs. How stable are these theories over time? To what extent are they related to implicit theories of intelligence? How closely are they related to personality traits and related cognitive-affective constructs such as locus of control and optimism? In addition to reappraisal, are implicit theories of emotion related to other emotion regulation strategies, including maladaptive ones? To what extent can the implicit theory model be applied to the domain of emotions? Do implicit theories of emotion predispose people to helpless- or mastery-oriented patterns of emotion regulation? Do entity and incremental emotion theorists show the same

cognitive, affective, and motivational outcomes as entity and incremental intelligence theorists when they encounter difficulty (cf. Hong et al., 1999)?

In this dissertation, I aimed to further develop a model of implicit theories that addresses how they influence emotion regulation and emotional experience. The major hypothesis is that beliefs about the controllability of emotions are related to whether and how people regulate their emotions, and that this regulation has implications for well-being. In one individual difference study and five experiments, I address four goals.

Goals of the Dissertation

Questionnaire Development and Examining the Nomological Network

First, I developed a questionnaire to measure individual differences in implicit theories of emotion. I expanded on previous research by measuring implicit theories of both positive and negative emotions, by examining the temporal stability of implicit theories, and by examining the nomological network surrounding implicit theories of emotion. Where do they fit within a constellation of cognitive-affective variables related to emotional experience and well-being? How are they related to broad personality and motivational variables? Are implicit theories of emotion distinguishable from implicit theories of intelligence, locus of control, emotion regulation self-efficacy, and emotional intensity?

Individual Differences in Emotion, Well-Being, and Emotion Regulation

Second, I examined the extent to which implicit theories are related to a range of well-being variables. Past research had linked incremental theories of emotion to the experience of more positive emotion, less negative emotion, lower self-reported depression, greater psychological well-being (broadly defined), and better social support

(Tamir et al., 2007). In Study 1, I examined several measures of well-being, replicating and extending past findings.

I also examined the role of emotion regulation in the relationship between implicit theories of emotion and well-being. As described above, I hypothesized that the emotion regulation strategies a person uses depend upon their beliefs about the changeability of emotion. Tamir and colleagues (2007) focused on cognitive reappraisal, a widely researched and generally effective emotion regulation strategy, but there is a wide range of other—effective and ineffective—strategies available (e.g., Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1988; Nolen-Hoeksema, 1991). I therefore expanded on past research by examining a broader range of emotion regulation and coping strategies, and examined whether the relationship between implicit theories and well-being is mediated by more adaptive emotion regulation.

The Effects of Implicit Theories on Emotion Regulation and Experience

Third, I investigated the causal effects of implicit theories of emotion on emotion regulation and experience during an emotion-eliciting event in the laboratory. Previous work on implicit theories in other domains has shown that although implicit theories tend to be stable over time and differ among individuals, entity and incremental theories can also be temporarily shifted (e.g., Chiu et al., 1997; Hong et al., 1999). To date, no published research has tested the causal relationship between implicit theories and emotion regulation and experience. I therefore developed a manipulation of implicit theories of emotion and used it to examine the effects on emotional experience (Study 2) and emotion regulation (Study 3).

In Study 2, I examined whether participants who read evidence supporting either an incremental or entity theory would respond differently to emotion-eliciting experiences. Specifically, would entity participants react more intensely to negative and positive emotional videos, compared to incremental participants? Would incremental participants report using more emotion regulation during the experience? In Study 3, I examined whether participants who read evidence for either an incremental or entity theory would differ in their ability to remain objective (one form of emotion regulation). Would incremental participants be more likely to regulate their emotions within this situation, compared to entity participants? In Study 3, I used explicit instructions regarding emotion regulation and a different set of stimuli than in Study 2 to examine emotional experience.

The Effects of Implicit Theories on Responses to Emotional Challenge

Fourth, I investigated whether implicit theories of emotion produce helpless and mastery patterns—differences in cognition, affect, and motivation—in the face of an emotionally demanding task. According to research in other domains, the influence of implicit theories is most potent in challenging situations (e.g., Beer, 2002; Dweck, 1999). Everyone, regardless of implicit theory, might have confidence in their abilities, feel positively, and persist in their efforts, as long as things are going well (Dweck, 1999). When people face a challenge, however, what they believe about the malleability or fixedness of psychological attributes influences how they think, feel, and behave. Implicit theories of intelligence influence how a person acts in the face of an academic challenge or failure (Dweck, 1999); implicit theories of shyness influence how a person acts in the face of a social challenge or failure (Beer, 2002). Specifically, entity theorists tend to

adopt a helpless-oriented pattern in response to challenge, in which they make maladaptive attributions for their failure, experience more negative affect, avoid further challenge, withdraw effort, and often decline in performance (Blackwell et al., 2007; Diener & Dweck, 1978; Hong et al., 1999; Robins & Pals, 2002). Incremental theorists tend to adopt a mastery-oriented pattern, in which they make adaptive attributions for failure, maintain positive affect, persevere by increasing their effort or changing their strategy, and ultimately improve in performance (see also Beer, 2002).

I hypothesized, therefore, that implicit theories of emotion would influence whether a person adopts a helpless or mastery pattern of emotion regulation. In Studies 4 and 5, I manipulated implicit theories of emotion, and asked participants to perform task that required them to regulate their emotions. After this task, I informed all (in Study 4) or a random half (in Study 5) of participants that they had performed poorly, and examined their attributions for their failure, their affect, and their motivation.

I hypothesized that in the domain of emotion, entity participants, who were provided with evidence that emotions are unchangeable, would attribute their emotion regulation difficulty to the strength of the emotions themselves or their own lack of ability—factors that are beyond their control. In contrast, incremental participants, who were provided with evidence that emotions are dynamic and changeable, would attribute their difficulty to lack of effort or use of an inappropriate strategy. I hypothesized that entity participants would feel more negative affect regarding their failure, compared to incremental participants. Finally, I hypothesized that entity participants would be more likely to withdraw from the task (in Study 4) and decrease their effort in a second round of the task (in Study 5), compared to incremental participants.

A Note on Self-Efficacy. I chose not to focus on emotion regulation self-efficacy— a person's belief about their own ability to regulate their emotions. Although in Tamir and colleagues' study, self-efficacy mediated the relationship between implicit theories and well-being, I focused directly on emotion regulation. Dweck has shown that confidence in one's academic abilities does not reliably predict performance or reactions to failure (Dweck, 1999; Elliot & Dweck, 1988), and confidence in the morality of the individuals was not enough to prevent entity theorists from making dispositional attributions for single behaviors (Chiu et al., 1997). Dweck (1999) reports that entity theorists with the highest confidence are often the ones who decline in class standing, and incremental theorists who have the lowest confidence are often the ones who improve in class standing. In Study 1, I examined the relationship between implicit theories and emotion regulation self-efficacy, but did not focus on it as a mediator. In the experimental studies, I focused directly on implicit theories of emotion and on emotion regulation.

Summary. In one individual difference study and four experiments, I investigated the relationship between implicit theories of emotion and emotional experience, emotion regulation, and cognitive, affective, and behavioral patterns in response to an emotionally challenging situation. I examined relationships among these variables at both the trait and state level, by both measuring and manipulating implicit theories of emotion.

CHAPTER II

STUDY 1: INDIVIDUAL DIFFERENCES IN IMPLICIT THEORIES OF EMOTION

Introduction

Study 1 investigated individual differences in implicit theories of emotion, and their relationship to personality, emotion regulation, emotional experience, and well-being. This study addressed the first two goals of this dissertation: developing a questionnaire to measure trait implicit theories of emotion and establishing a nomological network, and examining relationships with trait well-being and emotion regulation.

Developing a Questionnaire to Assess Implicit Theories of Emotion

The first goal of Study 1 was to develop a questionnaire to measure implicit theories of emotion—personal beliefs that individuals have regarding the malleability of emotions. Previous research on this topic has used a four-item questionnaire that measures implicit theories of emotion in general (Tamir et al., 2007), using items such as "No matter how hard they try, people can't really change the emotions that they have." These items are ambiguous with regard to the valence of emotions, however. When people are asked to recall instances of emotion regulation, most produce examples of regulating negative emotions (Gross, Richards, & John, 2005), suggesting that leaving the valence open-ended implies, but does not definitively refer to, negative emotions.

Both positive and negative emotions contribute to subjective well-being (e.g., Diener, Suh, Lucas, & Smith, 1999). The regulation of positive emotions, though it may not be the prototypical example of emotion regulation, is common in everyday life and also has important implications for well-being (Livingstone & Srivastava, in press; Tugade & Fredrickson, 2004). People have separate (but related) ideas regarding their

abilities to regulate positive and negative emotions (Bryant, 1989), which suggests that they may also have separate (but related) ideas regarding the malleability of positive and negative emotions. I therefore expanded on previous research by including new items to address beliefs about positive and negative emotions separately, creating a more comprehensive questionnaire to use throughout the following studies.

I hypothesized that items describing implicit theories of emotion would fall along a single bipolar dimension ranging from entity to incremental beliefs, similar to implicit theories in other domains (for an exception, see Knee, 1998). I had no specific hypothesis regarding whether people would hold different implicit theories of positive and negative emotions, but tested this as an exploratory research question.

Validation of the scale utilized two samples. Participants in the first sample completed the initial pool of 24 items; those in the second sample completed the same items and series of individual difference questionnaires. A subset of individuals participated in both samples, allowing me to examine test-retest stability. Tamir and colleagues (2007) found that people tend to see emotions as more malleable than intelligence, and speculated that this is because emotions are, by nature, short lived and change quickly. I hypothesized that implicit theories of emotions themselves will be more susceptible to fluctuation over time than implicit theories of intelligence, but will still demonstrate some degree of stability.

Establishing a Nomological Network

Study 1 also explored the construct of implicit theories of emotion, especially with regard to the degree of overlap with personality traits and cognitive-affective individual difference variables.

Relationships with Broad Personality Traits. Because research on implicit theories of emotion is new, it is helpful to establish how these beliefs are related to important personality variables. In particular, I examined the Big Five personality traits, the behavioral activation and inhibition systems, and optimism. For these variables, I predicted that individual differences in implicit theories of emotion would not be fully captured by broad personality traits and motivational systems, but did not make specific predictions regarding directions of correlations.

The personality traits of extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience, known collectively known as the Big Five, represent personality descriptors at the broadest level (John & Srivastava, 1999). A highly extraverted person is energetic, sociable, and assertive (vs. shy and introverted). A highly neurotic person has a tendency to feel anxious, sad, and tense (vs. emotionally stable). Extraversion and neuroticism are particularly relevant for emotional experience: Extraversion is associated with the experience of greater positive affect, and neuroticism is associated with the experience of greater negative affect (Costa & McCrae, 1980).

A highly agreeable person is oriented toward cooperation, trust, and modesty (vs. someone who is disagreeable). A highly conscientiousness person is goal-directed, responsible, and organized (vs. careless and disorganized). A person who is high on openness to experience is oriented toward new experiences, originality, and complexity (John & Srivastava, 1999).

Two other broad dimensions related to the experience of emotion are the motivational systems called the behavioral activation system (BAS) and the behavioral inhibition system (BIS). The BIS includes vigilance for and sensitivity to negative events

(punishments), whereas the BAS includes vigilance for and sensitivity to positive events (rewards; Carver & White, 1994). According to one model, the BAS consists of three subsystems: fun-seeking (attraction to possibly rewarding experiences), drive (perseverance in pursuing a desired end-state), and reward responsiveness (intense positive reaction to rewarding stimuli; Carver & White, 1994).

Finally, I examined an additional personality trait that is not captured well by the Big Five or by BIS/BAS, but that could be relevant to implicit theories of emotion. Trait optimism—a stable tendency to expect positive outcomes rather than negative ones— is associated with coping strategies and a range of well-being outcomes (Scheier, Carver, & Bridges, 1994).

Discriminant Validity. In addition to exploring relationships with other constructs, it is also important to distinguish implicit theories of emotion from possibly overlapping cognitive-affective variables.

First, implicit theories of emotion should be distinct from implicit theories of intelligence—beliefs about the malleability of intelligence. In most past research, implicit theories are domain specific, and have implications for dependent variables only within the same domain (Dweck et al., 1995). Tamir et al. (2007) showed that implicit theories of emotion are related to, but distinct from, implicit theories of intelligence. I sought to replicate this finding, and show that relationships between implicit theories of emotion and emotional experience and regulation are due to implicit theories of emotion, rather than overarching implicit theories in general.

Second, implicit theories of emotion should be distinct from locus of control—a tendency to view events either as internally caused or externally caused (Rotter, 1966). A

person with an internal locus of control believes that outcomes are dependent on one's own actions, whereas a person with an external locus of control believes that outcomes are dependent on external factors, such as luck or the actions of others. An entity theory of emotions should be related to an external locus of control: If emotions are unchangeable and one is helpless to do anything about them, then they should be determined by external factors. Locus of control is a domain-general construct, however, so the association between these two variables was not expected to be large (see Dweck & Leggett, 1988).

Third, implicit theories of emotion should be distinct from emotion regulation self-efficacy—a person's confidence in his or her ability to regulate emotions (see Tamir et al., 2007). Theoretically, an incremental theory of emotions should predict higher emotion regulation self-efficacy: If a person believes that emotions are malleable, he or she should have more confidence in his or her ability to regulate emotions. The two concepts are not redundant, however, and it may be that some people believe emotions in general are malleable, but that they are not good at regulating their own emotions. Other people may have generally high confidence in their ability to control their emotions when they are calm, but when they actually experience them, emotions seem uncontrollable.

Dweck's research (1999) has repeatedly shown that confidence in academic abilities does not predict how a student responds to challenge. In the domain of emotions, I expect that incremental theorists will have higher emotion regulation self-efficacy than entity theorists, but that confidence plays only a small role in predicting emotion regulation and experience.

Finally, implicit theories of emotion should be distinct from emotional intensity. Perhaps the people who believe emotions are not controllable have stronger emotions in the first place. The strength of their emotional impulses, therefore, may be what is driving the relationship between implicit theories of emotion and emotional experience. Thus, I will examine whether entity theorists do have more intense emotions, and whether this is why they are less likely and able to regulate their emotions.

Correlations between implicit theories and these variables should be positive, but small to moderate in size. In addition, relationships between implicit theories of emotion and emotional experience, emotion regulation, and well-being should be significant even when controlling for these variables.

Relationships with Emotional Experience and Well-Being

In past research, incremental theories of emotion predicted more positive emotion and less negative emotion over the first few months of college, and lower levels of depression at the end of the first year (Tamir et al., 2007). In Study 1, I examined associations with a broader range of variables, including subjective well-being, psychological well-being, self-esteem, depression, anxiety, and perceived stress. I hypothesized that, consistent with Tamir et al., (2007), incremental theories of emotion would be related to more positive emotion and less negative emotion, and more positive well-being overall.

Subjective well-being consists of high levels of positive emotion, low levels of negative emotion, and high levels of satisfaction with life, and thus includes both cognitive and emotional aspects of what is sometimes called "happiness" (Diener et al., 1999). These three dimensions can be measured separately, because at the trait level,

experiences of negative and positive emotion are somewhat independent (Watson, Clark, & Tellegen, 1988), and life satisfaction is a cognitive dimension, rather than an emotional one (Diener et al., 1999).

There are also several dimensions of positive psychological functioning that do not necessarily imply a positive affect balance (Ryff, 1989). Ryff has identified six dimensions: positive relations with others (having close, trusting relationships and being sensitive to others' needs), autonomy (a sense of independence and a feeling that one is in control of one's own actions), environmental mastery (a sense of competence and control over one's environment), purpose in life (a sense of direction and broad goals), personal growth (a sense of self-improvement and development), and self-acceptance (a positive attitude toward oneself). In particular, an incremental theory of emotion should be related to environmental mastery and autonomy, because it implies a sense of control, and to positive relations with others, because incremental theories of emotions should allow people to regulate their emotions in such a way as to maintain and improve relationships (cf. Tamir et al., 2007).

In addition to the variables listed above, I examined whether implicit theories are related to specific positive emotions such as joy, love, and pride, as well as to self-esteem and the expression of positive emotions. To examine negative functioning, I examined correlations with specific negative emotions such as anger, sadness, and shame, as well as with symptoms of anxiety, depression, and stress.

Relationships with Emotion Regulation and Coping

I also examined which emotion regulation strategies entity and incremental theorists are most likely to draw upon. If a person believes that emotions are

uncontrollable, he or she may not be sure about how to go about managing his or her emotions. Emotional experience almost always includes some form of emotion regulation, even if it is dysregulation (Cole, et al., 1994). The question remains, then, how do entity emotion theorists go about regulating their emotions?

Helpless Emotion Regulation. Entity theorists in other domains respond to challenge with helplessness: They withdraw effort and disengage from the task (Dweck, 1999). What would helplessness in emotion regulation look like? First, entity theorists may attempt to avoid emotions in the first place. People who find emotions threatening generally report trying to avoid them (Maio & Esses, 2001). Although it is possible to predict and avoid situations in which you expect to experience negative affect (Gross, 1998b), it is often counterproductive (e.g., Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011).

Second, entity theorists might attempt to disengage from an emotional situation that threatens their goals, rather than confront the emotions. Behavioral disengagement essentially involves giving up on one's goal and withdrawing effort in the face of a stressor (e.g., "I admit to myself that I can't deal with it, and quit trying"), whereas mental disengagement involves trying to distract oneself from the stressor or the goals the stressor is interfering with, that is, not thinking about one's goals or the stressor (e.g., "I daydream about things other than this"; Carver et al; 1989). These strategies can be adaptive in some circumstances, but when used habitually, are considered maladaptive (Carver et al., 1989).

Third, entity theorists may attempt to target the expression of emotion, rather than the experience of the emotion itself. One option is to hide the expression of emotion, a

process known as expressive suppression (Gross, 1998a). Although expressive suppression results in lower expressivity of negative emotion, it does not reduce the experience of the emotion itself, and can result in more intense physiological arousal (Gross, 1998a) and cognitive and social impairments (Butler, Egloff, Wilhelm, Smith, Erickson, & Gross, 2003; see also Gross & John, 2003). Another option is to vent one's emotions: to express one's emotions and to "let them out" (Carver et al., 1989). Despite the popular idea that venting one's emotions is associated with a beneficial "release" (catharsis), evidence suggests that that deeply feeling and expressing negative emotions actually makes things worse (e.g., Kraemer & Hastrup, 1988).

Finally, entity theorists may simply try to focus on their emotions and their causes and consequences in an attempt to understand them—that is, to ruminate on them. Rumination involves repetitively and passively thinking about negative events, one's distress, and the causes and consequences of it (Nolen-Hoeksema, 1991). It has consistently been linked to depression, negative thinking, and poor problem solving (for a review, see Nolen-Hoeksema et al., 2008). Entity theories orient people toward evaluation and prediction (Dweck et al., 1995; Knee et al., 2003), which suggests that entity theorists may turn to rumination rather than active emotion regulation and problem-solving.

Mastery-Oriented Emotion Regulation. The strategies listed above are generally maladaptive ones, in the sense that they may be useful within given contexts, but when used habitually, are associated with lower well-being. In contrast, habitual use of other strategies (including cognitive reappraisal, discussed earlier) is associated with more positive well-being.

In general, I predict that incremental theorists will be more likely to engage in mood repair—actively attempting to reduce negative emotions (e.g., "If I find myself getting angry, I try to calm myself down"; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Along with attention and clarity, repair is one dimension of meta-mood: the approaches that people take to dealing with their emotions (Salovey et al., 1995). Entity and incremental theorists may pay equal amounts of attention to their emotions, and may even clearly perceive emotions in themselves, but incremental theorists should be more likely than entity theorists to try to repair negative moods.

In addition, I predict that incremental theorists will be more likely to use adaptive forms of coping with stress. In particular, they should be more likely to use active coping, which involves initiating direct action, increasing effort, and persisting in a systematic way—essentially the opposite of behavioral disengagement (Carver et al., 1989). In addition, incremental theorists should engage in more positive reframing, which involves reinterpreting the situation in a more positive light (Carver et al., 1989), and is conceptually related to cognitive reappraisal. Thus, overall, an incremental theory should be positively related to the mastery-oriented strategies, and negatively related to the helpless-oriented strategies.

Is the Effect of Implicit Theories on Well-Being Mediated by Emotion Regulation?

Finally, I tested whether the relationship between implicit theories and well-being is mediated by emotion regulation. I hypothesized that the relationship between implicit theories of emotion and well-being would be mediated by greater use of mastery-oriented emotion regulation and coping strategies, and by less use of helplessness-oriented emotion regulation and coping strategies. I examined this mediation model at two levels:

general approaches to emotion, and use of specific adaptive and maladaptive strategies. Because this is the first study to test this hypothesis, I tested both models to better understand the meditational processes. I chose to examine broad approaches to emotions (avoidance and mood repair) because they represent general orientations to emotions that incremental and entity theorists are likely to differ on. I chose to examine particular strategies as well because they represent more concrete approaches to dealing with emotions once they have arisen.

General Approaches to Emotion. First, I examined whether the relationship between implicit theories of emotion and well-being is mediated by general approaches to emotion. To represent a helpless-oriented approach to emotion, I examined mediation by the general tendency to avoid emotions. To represent a mastery-oriented approach to emotion, I examined mediation by the general tendency to repair negative moods. These two approaches may be correlated with each other, but because they occur at different stages of the emotional generation process, it is possible that a person could use both, or neither. I predict, however, that incremental theorists will be more likely to use mood repair, and less likely to try to avoid emotions, compared to entity theorists, and that differential use of these approaches will predict emotional experience.

Specific Emotion Regulation Strategies. Second, I examined whether the relationship between implicit theories of emotion and well-being is mediated by the use of two specific emotion regulation strategies. To represent a helplessness-oriented emotion regulation strategy, I examined behavioral disengagement, which involves giving up on one's efforts in the face of difficulty, and is conceptually linked to helplessness (Carver et al., 1989). To represent a mastery-oriented emotion regulation

strategy, I examined mediation by cognitive reappraisal, which is a commonly researched strategy that is generally considered flexible and efficient (e.g., Gross, 1998a; Gross & John, 2003). Again, I expected that the two strategies would be correlated, but not completely overlapping, and that each would mediate the relationship between implicit theories of emotion and emotional experience.

Method

Sample 1

Participants. Participants were 278 undergraduate students enrolled in the human subject pool at the University of Oregon who participated in a general survey—an online survey session consisting of a variety of short (less than 5-minute long) measures.

Measure and Procedure. Participants rated their agreement with 24 items generated to assess implicit theories of emotion, which included the four original items used in Tamir et al.'s study, and an additional 20 items, comprised of five incremental items regarding positive emotions (e.g., "No matter the situation, you can always influence your positive emotions"), five incremental items regarding negative emotions (e.g., "You can control your negative reactions to bad situations"), five entity items regarding positive emotions (e.g., "Positive emotions are caused by forces beyond your control"), and five entity items regarding negative emotions (e.g., "Negative emotions just happen to you, and there is nothing you can do about them"). See Appendix A for the complete list of items. The response scale for these items ranged from 1 ("disagree strongly") to 5 ("agree strongly").

Sample 2

Participants. Participants were 262 undergraduates from the University of Oregon human subject pool (183 female, 76 male; M_{age} = 19.29, *SD* = 1.79, range 17 to 35). They signed up for and completed the one-hour long study online.

Procedure. After reading an informed consent page, all participants completed the 24-item implicit theories of emotion questionnaire, then a series of individual difference questionnaires. These included measures of personality traits, measures of emotional regulation and coping styles, and measures of emotional experience and well-being.

There were two versions of the main study. All participants completed measures of implicit theories of emotion, academic self-efficacy, emotional expressivity, the Big Five personality traits, depression, cognitive reappraisal and expressive suppression, positive and negative affect, emotional avoidance, rumination, implicit theories of intelligence, life satisfaction, and mood repair. The first subset of the main sample (*N* = 187) also completed measures of behavioral activation and inhibition, coping, optimism, psychological well-being, and self-esteem. The second subset of the main sample (*N* = 75) completed measures of anxiety and locus of control instead. All continuous variables were transformed so that they ranged from a possible 0 to a possible 100, to provide more intuitive interpretation (see Cohen, Cohen, Aiken, & West, 1999). Descriptive statistics for all measures are reported in Appendix B.

Measures of Personality Traits. The Big Five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness) were measured using the 44-item Big Five Inventory (John & Srivastava, 1999). Behavioral activation and

behavioral inhibition were measured using the Behavioral Activation Scale, which measures reward responsiveness, fun-seeking, and drive; and the Behavioral Inhibition Scale (Carver & White, 1994). Trait optimism was measured using the 10-item Life Orientation Test (Scheier, Carver, & Bridges, 1994).

Discriminant Validity. Participants completed a 4-item measure of implicit theories of intelligence (Dweck, 1999). Participants also rated their academic self-efficacy using 10 items (e.g. "If you really wanted to, how confident are you that you can… complete your homework assignments on time?") on a scale from 0 to 100. Locus of control was measured using a 13-item version of Rotter's forced-choice Locus of Control Scale (Rotter, 1966). Emotion regulation self-efficacy was measured using a 10-item measure of emotion-regulation self-efficacy used in Tamir et al.'s (2007) study. In this measure, participants indicated their confidence in being able to regulate specific emotions within specific situations (e.g., "If you really wanted to, how confident are you that you can… decrease your anxiety during an important examination?") on a scale from 0 to 100. Emotional intensity was measured using the 4-item Impulse Strength subscale of the Berkeley Expressivity Questionnaire (Gross & John, 1995).

Measures of Emotional Experience and Well-Being. Trait-level positive and negative affect were measured with the 20-item Positive and Negative Activation Schedule (Watson, Clark, & Tellegen, 1988). In addition to the PANAS items, I also included a number of specific emotions (amusement, hope, interest, joy, love, pride, anger, anxiety, contempt, disgust, embarrassment, fear, guilt, loneliness, sadness, and shame), each of which was measured using one or more items. Emotional expression was

measured using the Berkeley Expressivity Questionnaire (Gross & John, 1995), which measures expressivity of positive emotions (3 items) and of negative emotions (5 items).

Positive well-being was measured with the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), the 10-item Rosenberg Self-Esteem questionnaire (Rosenberg, 1965), and the 18-item Psychological Well-Being questionnaire (Ryff, 1989), which has six subscales: autonomy, environmental mastery, purpose in life, personal growth, positive relations with others, and self-acceptance. Well-being deficits were measured using the 20-item Center for Epidemiological Studies-Depression scale (Radloff, 1977), a measure of depressive symptoms intended for the general population; the 4-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983); and the 21-item Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988).

Measures of Emotion Regulation and Coping. Cognitive reappraisal and expressive suppression were measured using the 10-item Emotion Regulation Questionnaire (Gross & John, 2003). Rumination was measured using the 12-item rumination subscale of the Rumination and Reflection Questionnaire (Trapnell & Campbell, 1999). Coping was measured with the 28-item brief COPE (Carver, 1997), which measures 14 coping styles with two items each. Tendencies to approach and avoid emotions were measured using the Need for Affect Scale (Maio & Esses, 2001). General mood repair was measured with the 30-item Trait Meta-Mood Scale (Salovey, et al., 1995), which measures tendencies to attend to affect (attention), be able to clearly identify affect (clarity), and to repair negative affect (repair).

Results

Questionnaire Development

Factor Structure in Sample 1. The data from the 24 items administered to Sample 1 were subjected to an exploratory factor analysis using principle axis factoring. Four factors with eigenvalues greater than one were extracted, although the scree plot showed a large single factor, which explained 34.3% of the variance (see Figure 1). The second, third, and fourth factors accounted for small amounts of variance (4.3%, 3%, and 2.6%, respectively).

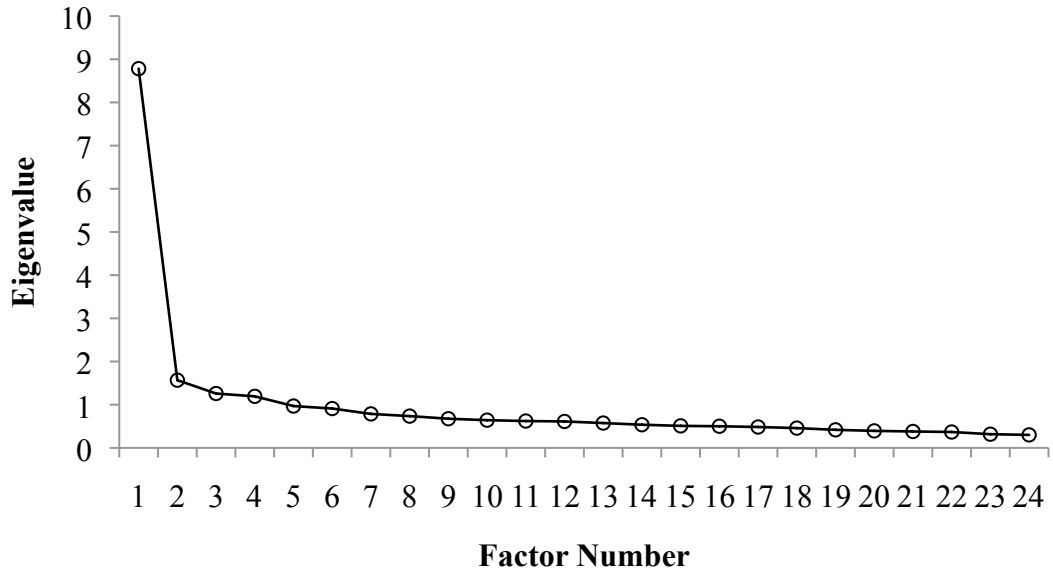

Figure 1. Scree plot for exploratory factor analysis of the 24 implicit theories of emotion items in sample 1.

Possible alternative factor structures could include entity vs. incremental or positive emotion vs. negative emotion (both two-factor solutions) or a four-factor solution in which positive entity, negative entity, positive incremental, and negative incremental loaded separately. Although the scree plot did not suggest more than one

factor, two- and four-factor solutions were extracted for exploratory purposes, using exploratory factor analysis with oblique rotation, to allow the factors to covary. The two factor structure was consistent with incremental and entity factors, but these factors correlated at $r = -.72$, $p < .001$, which suggests that a single factor is appropriate. The four-factor solution was not consistent with the theorized structure.

Replication of Factor Structure in Sample 2. The factor analysis on the 24 items was repeated in the Sample 2, after removing those who also participated in Sample 1 (remaining $N = 195$). A large first factor accounted for 30.9% of the variance. The factor loadings in the two samples correlated strongly, although the items loaded in different directions (coefficient of congruence = -.99). Factor loadings for the single factor structure are reported in Table 1. In Sample 2, however, the scree plot indicated a possible two-factor solution (see Figure 2), with the second factor explaining an additional 5.7% variance. The two-factor structure was consistent with incremental and entity factors, but the two factors correlated strongly, $r = -.64$, $p < .001$. The four-factor solution was not consistent with the theorized structure. See Table 1 for factor loadings in samples 1 and 2.

Scale Construction. In designing a new measure of trait implicit theories of emotion, the first goal was to improve content validity by including items that addressed the controllability of both positive and negative emotions. The second goal was to have sufficient internal consistency among items, but in a relatively short scale, so that it could be used flexibly in individual difference research. I selected items based on the single factor structure, but included enough entity and incremental items to allow scoring of subscales with sufficient internal consistency.

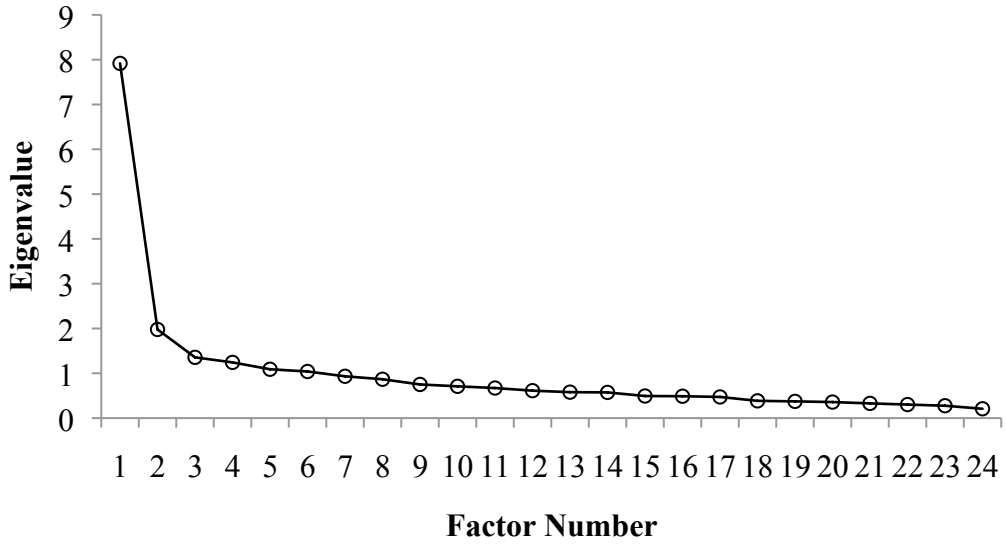

Figure 2. Scree plot for exploratory factor analysis of implicit theories of emotion items in sample 2

Table 1. Factor loadings for exploratory factor analysis in samples 1 and 2.

Item	Theory	Valence	Factor Loading Sample 1	Factor Loading Sample 2
The truth is, people have very little control over their emotions.[a]	E	G	-.70	.66
It is usually not possible to change your negative emotions.[a]	E	N	-.68	.66
No matter how strong a person's negative emotions are, they can always find a way to change them.[a]	I	N	.67	-.55
You can learn to do something about your negative emotions.[a]	I	N	.66	-.58
No matter how hard they try, people can't really change the emotions they have.[a]	E	G	-.66	.63
If they want to, people can change the emotions that they have.[a]	I	G	.66	-.59
When you have negative emotions, you cannot do much to change them.[a]	E	N	-.66	.68
Negative emotions just happen to you, and there is nothing you can do about them.[a]	E	N	-.64	.53

Table 1 (continued). Factor loadings for exploratory factor analysis for samples 1 and 2

Item	Theory	Valence	Factor Loading Sample 1	Factor Loading Sample 2
Positive emotions come and go, and there is not much you can do about them.[a]	E	P	-.63	.64
I believe that I am in control of my positive emotions.[a]	I	P	.63	-.54
No matter the situation, you can always influence your positive emotions.[a]	I	P	.63	-.53
People can learn to influence when and how they experience positive emotions.	I	P	.61	-.53
Anyone can learn to influence the positive emotions that they feel.	I	P	.61	-.42
There is not much a person can do to influence when and how they experience positive emotions.	E	P	-.59	.52
When you are feeling bad, there are things you can do to influence your emotions.	I	N	.57	-.51
There is no use in trying to influence your positive emotions; you have to just let them happen.	E	P	-.55	.64
You can control your negative reactions to bad situations.	I	N	.54	-.54
Negative emotions are something that people have control over.	I	N	.52	-.65
Everyone can learn to control his or her emotions.[a]	I	G	.51	-.45
Positive emotions are caused by forces beyond your control.	E	P	-.50	.46
When a person feels negative emotions, they have to just let them run their course.	E	N	-.44	.47
When people feel positive emotions, it's because they made them happen	I	P	.43	-.38
A positive emotion is something that happens to you, not something you make happen.	E	P	-.41	.45
There is no use in trying to avoid negative emotions.	E	N	-.32	.49
N			278	195

Note. E = entity, I = incremental, G = general, N = negative, P = positive.
[a] item included in shortened form of the Emotional Mindset Scale (EMS).

To ensure content validity, while reducing the number of items, I retained the top two loading items from each of the positive incremental, negative incremental, positive entity, and negative entity subscales. In addition, the four items used in Tamir and colleagues' research were included, to compare across studies[2]. This yielded a 12-item Emotional Mindset Scale (EMS; see Appendix A)[3].

Scale Properties. EMS properties in both samples are reported in Table 2. The EMS had good internal consistency in both samples ($\alpha_1 = .89$, $\alpha_2 = .85$). The Cronbach's alpha coefficients for the EMS were higher than those for the original four-item scale used in Tamir et al., ($\alpha_1 = .73$, $\alpha_2 = .64$). The six entity items ($\alpha_1 = .82$, $\alpha_2 = .81$) and six incremental items ($\alpha_1 = .82$, $\alpha_2 = .76$) had adequate to good internal consistency in both samples. The four items addressing negative emotions ($\alpha_1 = .78$, $\alpha_2 = .68$) and the four items addressing positive emotions ($\alpha_1 = .73$, $\alpha_2 = .64$) had slightly lower internal consistency.

The EMS was scored as a continuous variable with higher scores indicating a stronger incremental theory of emotion. In sample 2, participants generally saw emotions ($M = 64.59$, $SD = 13.15$) as slightly more malleable than intelligence ($M = 60.10$, $SD = 23.93$), $t(259) = -2.97$, $p = .003$, $d = .23$, which was also found by Tamir et al. (2007).

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[2] Three of the four items from the original scale were among the top-loading items. The exception was "Everyone can learn to control his or her emotions," which loaded at .51.

[3] In naming the scale, I chose to use the term "mindset," rather than "implicit theories of emotion," to distinguish it from the original four-item scale used in Tamir et al. (2007), and also to avoid confusion with implicit evaluation of emotion regulation (e.g., Mauss, Evers, Wilhelm, & Gross, 2006). Throughout this dissertation, I will use the term Emotional Mindset to refer specifically to the scale developed here, and implicit theories of emotion to refer to the construct in general.

Gender Differences. In sample 2, the mean emotional mindset score for males (n = 76) was 63.10 (SD = 13.66), whereas the mean emotional mindset score for females (n = 183) was 65.16 (SD = 12.99). This difference was nonsignificant, $t(257) = -1.15$, p = .25. This is similar to implicit theories of intelligence, personality, and morality, which typically do not vary by gender (Dweck et al., 1995).

Table 2. Emotional Mindset Scale properties in samples 1 and 2

	Sample 1	Sample 2
Internal consistency (α)		
EMS 12-item	.89	.85
Original 4-item	.73	.64
Entity 6-item	.82	.81
Incremental 6-item	.82	.76
Negative 4-item	.78	.68
Positive 4-item	.73	.64
Subscale Intercorrelations		
Entity-Incremental	-.72	-.58
Negative-Positive	.68	.65
Mean (SD)	68.40 (16.77)	64.59 (13.15)
Range	8.33- 100	25-100
Skew (SE)	-.40 (.15)	-.35 (.15)
N	278	262

Test-Retest Reliability. A subset of the participants (n = 66) took the EMS both as part of Sample 1 and Sample 2. Participants generally took the questionnaire first at the beginning of the term as part of the general survey, and enrolled in the main study over the next several weeks. On average, there were 9.38 days (SD = 8.78) between sessions, with a range of 0 to 28 days (median = 7.5). Participants who took the questionnaire twice on the same day were excluded (remaining n = 53).

The short-term test-retest reliability was calculated by correlating participants' scores in the general survey and in Study 1. The test-retest reliability for the 12-item EMS was $r(51) = .59$, $p < .001$. This is comparable to the original four-item scale, which had a test-retest reliability of $r(51) = .56$, $p < .001$, in this sample. This suggests that emotional mindset is somewhat stable over time, but not as stable as personality traits such as the Big Five or as implicit theories of intelligence (Dweck et al., 1995).

Personality Traits and Individual Differences

Correlations between implicit theories and personality traits are presented in Table 3. Those who held an incremental theory of emotion were more likely to score higher on agreeableness, $r(257) = .25$, higher on openness, $r(257) = .22$, and lower on neuroticism, $r(257) = -.25$. An incremental theory had small correlations with conscientiousness, $r(257) = .20$, and extraversion, $r(257) = .16$. An incremental theory was associated with greater optimism, $r(183) = .38$, but implicit theories of emotion were not related to behavioral activation or inhibition.

Discriminant Validity

Correlations between implicit theories of emotion and cognitive-affective traits are presented in Table 4. As expected, EMS had small positive correlations with implicit theories of intelligence, $r(257) = .25$, and with emotion regulation self-efficacy, $r(255) = .23$. It did not significantly correlate with locus of control, $r(73) = .17$, although this could be due to the low internal reliability of the locus of control scale ($\alpha = .35$) or to the smaller sample size. EMS did not significantly correlate with emotional intensity (impulse strength), $r(255) = -.05$.

Table 3. Zero-order and partial correlations between implicit theories of emotion and personality traits

			Variable Controlled For		
	N	*r*	ITI	ERSE	LOC[a]
BFI Extraversion	259	.16*	.15*	.13*	**.31*** **
BFI Agreeableness	259	**.25*** **	.18**	.24***	**.22***
BFI Conscientious.	259	.20**	.17**	.16**	**.38*** **
BFI Neuroticism	259	**-.25*** **	**-.24*** **	-.18**	-.12
BFI Openness	259	**.22*** **	.20**	.17**	**.33*** **
BAS Drive	181	.06	.07	.06	–
BAS Fun-Seeking	181	.11	.10	.09	–
BAS Reward Resp.	181	.02	.01	.04	–
BIS Inhibition	181	-.02	-.17*	-.12	–
LOT Optimism	185	**.38*** **	**.35*** **	**.35*** **	–

Note. Bold numbers significant controlling for family-wise error. ITI = Implicit Theories of Intelligence; ERSE = Emotion Regulation Self-Efficacy; LOC = Locus of Control. BFI = Big Five Inventory; BAS = Behavioral Activation System; BIS = Behavioral Inhibition System; LOT = Life Orientation Test.

[a] BAS and LOT were not measured in the same subsample as locus of control ($N = 75$).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Zero-order and partial correlations between implicit theories of emotion and other cognitive-affective personality variables

			Variable Controlled For		
	N	*r*	ITI	ERSE	LOC[a]
Incremental theory of intelligence	260	**.25*** **	–	.23***	.14
Emotion regulation self-efficacy	257	**.24*** **	**.22*** **	–	**.35*** **
Locus of control	75	.17	.13	.18	–
Impulse strength	255	-.05	-.05	.01	-.07

Note. Bold numbers significant controlling for family-wise error. ITI = Implicit Theories of Intelligence; ERSE = Emotion Regulation Self-Efficacy; LOC = Locus of Control.

[a] $N = 75$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Emotional Experience and Well-Being

Correlations between implicit theories of emotion and emotional experience are presented in Table 5. An incremental theory was associated with more trait positive

affect, $r(258) = .33$, and with most specific positive emotions (amusement, hope, interest, joy, love, and pride). An incremental theory was also associated with less negative affect, $r(258) = -.25$. and with most specific negative emotions (anger, anxiety, contempt, disgust, embarrassment, fear, loneliness, and sadness).

Table 5. Zero-order and partial correlations between implicit theories of emotion and trait emotional experience

			Variable Controlled For		
	N	*r*	ITI	ERSE	LOC[a]
			Positive Emotion		
PANAS					
Positive Affect	260	**.33*****	**.32*****	**.28*****	**.42*****
Amusement	260	**.24*****	**.25*****	**.21****	.23*
Hope	260	**.37*****	**.36*****	**.36*****	.34**
Interest	260	**.24*****	**.22*****	.19**	.21
Joy	260	**.32*****	**.30*****	**.29*****	.29*
Love	260	**.23*****	**.23*****	**.23*****	.21
Pride	260	**.26*****	**.26*****	**.23*****	.26*
BEQ Positive Expressivity	255	.16*	.11	.15*	.13
			Negative Emotion		
PANAS					
Negative Affect	260	**-.25*****	**-.22*****	-.19**	-.19
Anger	260	**-.28*****	**-.26*****	**-.23*****	-.26*
Anxiety	260	**-.23*****	**-.22*****	-.16*	-.23*
Contempt	260	**-.23*****	**-.22*****	-.20**	-.21
Disgust	260	-.20**	-.20**	-.17**	-.16
Embarrassment	260	**-.23*****	**-.22*****	-.20**	-.22
Fear	260	-.20**	-.18**	-.14*	-.22
Guilt	260	-.17**	-.14*	-.12*	-.15
Loneliness	260	**-.25*****	**-.25*****	**-.22*****	-.22
Sadness	260	**-.32*****	**-.33*****	**-.28*****	-.31**
Shame	260	-.17**	-.13*	-.11	-.13
BEQ Negative Expressivity	255	-.06	-.09	-.003	-.10

Note. Bold numbers significant controlling for family-wise error. ITI = Implicit theory of intelligence; ERSE = Emotion Regulation Self-Efficacy; LOC = Locus of control; PANAS = Positive and Negative Affect Schedule. BEQ = Berkeley Expressivity Questionnaire.

[a] $N = 75$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Correlations between implicit theories of emotion and well-being variables are presented in Table 6. An incremental theory was associated with greater life satisfaction, $r(256) = .27$, self-esteem, $r(258) = .27$, environmental mastery, $r(183) = .29$, and self-acceptance, $r(183) = .22$, and with fewer depressive symptoms, $r(257) = -.27$ and perceived stress, $r(257) = -.24$. EMS was unrelated to emotional expressivity, autonomy, personal growth, positive relationships, purpose in life, or symptoms of anxiety, as measured by the BAI, although it was related to anxiety as measured as an emotion, and to trait neuroticism.

Table 6. Zero-order and partial correlations between implicit theories of emotion and well-being variables

			Variable Controlled For		
	N	*r*	ITI	ERSE	LOC[a]
SWLS Life Satis.	258	**.27*** **	**.26*** **	**.23*** **	**.42*** **
RSE Self-Esteem	260	**.27*** **	.25**	.22**	–
PWB Env. Mastery	185	**.29*** **	**.27*** **	.24**	–
PWB Self-Accept.	185	.22**	.21**	.20**	–
PWB Pos. Relation.	185	.04	.01	.02	–
PWB Pers. Growth	185	.03	.00	.02	–
PWB Purp. in Life	185	.05	.02	.04	–
PWB Autonomy	185	.11	.11	.09	–
BAI Anxiety	75	-.03	.00	-.11	.09
CESD Depression	259	**-.27*** **	**-.26*** **	**-.22*** **	-.18
PSS Perceived Stress	259	**-.24*** **	**-.23*** **	-.20**	-.15

Note. Bold numbers significant controlling for family-wise error. ITI = Implicit theory of intelligence; ERSE = Emotion Regulation Self-Efficacy; LOC = Locus of control; SWLS = Satisfaction with Life Scale; RSE = Rosenberg Self-Esteem; PWB = Psychological Well-Being; BAI = Beck Anxiety Inventory; CESD = Center for Epidemiological Study—Depression; PSS = Perceived Stress Scale

[a] RSE and PWB were not measured in the same subsample as locus of control ($N = 75$).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Emotion Regulation and Coping

Correlations. Correlations between implicit theories of emotion and emotion regulation are presented in Table 7. An incremental theory was associated with greater use of cognitive reappraisal, $r(258) = .45$, attention to mood, $r(257) = .22$, and repair of negative mood, $r(257) = .39$, and with less use of rumination, $r(258) = -.19$, and avoidance of emotion, $r(258) = -.25$. EMS was not correlated with expressive suppression or approach of emotions.

Table 7. Correlations between implicit theories of emotion and emotion regulation

			Variables Controlled For		
	N	*r*	ITI	ERSE	LOC[a]
ERQ Reappraisal	260	**.45*****	**.43*****	**.41*****	**.49*****
ERQ Suppression	260	-.10	-.08	-.12	-.24*
TMMS Attention	259	**.22*****	.18**	**.24*****	.28**
TMMS Clarity	259	.17**	.15*	.13*	.19
TMMS Repair	259	**.39*****	**.36*****	**.36*****	**.48*****
RRQ Rumination	260	-.19**	-.17**	-.13*	-.12
NFA Emotion Approach	260	.04	.03	.07	.17
NFA Emotion Avoidance	260	**-.25*****	**-.21*****	**-.25*****	-.22

Notes. Bold numbers significant controlling for family-wise error. ITI = Implicit theory of intelligence; ERSE = Emotion Regulation Self-Efficacy; LOC = Locus of control; ERQ = Emotion Regulation Questionnaire; TMMS = Trait Meta-Mood Scale; RRQ = Reflection and Rumination Questionnaire; NFA = Need for Affect.
[a] $N = 75$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Correlations between implicit theories of emotion and coping are presented in Table 8. An incremental theory of emotion was associated with greater use of acceptance, $r(183) = .21$, active coping, $r(183) = .22$, planning, $r(183) = .21$, and positive reframing, $r(183) = .23$, and with less behavioral disengagement, $r(183) = -.27$, denial, $r(183) = -.21$,

and self-blame, $r(183) = -.20$. EMS had no significant relationships to seeking emotional support, humor, instrumental support, religion, self-distraction, substance use, or venting.

Empirically Identifying Helpless and Mastery-Oriented Strategies. In addition to examining the patterns of correlations with theoretically defined helpless and mastery-oriented emotion regulation and coping strategies, we can also examine the relationships each strategy has with well-being. As an exploratory analysis, I calculated the correlation

Table 8. Correlations between implicit theories of emotion and coping strategies

		Variables Controlled For	
	r	ITI	ERSE
Positive Reframing	.23**	.23**	.21**
Active Coping	.22**	.21**	.20**
Acceptance	.21**	.21**	.19*
Planning	.19*	.21**	.18*
Self-Distraction	.12	.12	.12
Emotional Support	.10	.11	.12
Religion	.07	.10	.11
Humor	.04	.04	.01
Instrumental Support	.04	.07	.05
Substance Use	-.14	-.08	-.11
Venting	-.16	-.15	-.13
Denial	-.21**	-.16*	-.17*
Self-Blame	-.20**	-.20**	-.17*
Behavioral Disengagement	**-.27*** **	-.23**	-.22**

Notes. $N = 185$. Bold numbers significant controlling for family-wise error. ITI = Implicit theory of intelligence; ERSE = Emotion Regulation Self-Efficacy. Coping and locus of control were not measured in the same subsample.
* $p < .05$. ** $p < .01$. *** $p < .001$.

between each strategy and its affect balance (positive affect minus negative affect). Strategies with positive correlations indicate that the more a person reports using that strategy, the more positive their affect balance is (the higher their ratio of positive to negative affect). Strategies with negative correlations indicate that the more a person

reports using that strategy, the more negative their affect balance is (the smaller their ratio of positive to negative affect, or the larger their ratio of negative to positive affect).

I then examined how implicit theories of emotion are related to these strategies. Figure 3 shows that the stronger a person's incremental beliefs are, the more likely they are to use emotion regulation strategies associated with more positive and less negative affect, such as cognitive reappraisal and mood repair, and the less likely they are to rely on emotion regulation strategies that are associated with more negative and less positive affect, such as rumination and avoidance of emotions.

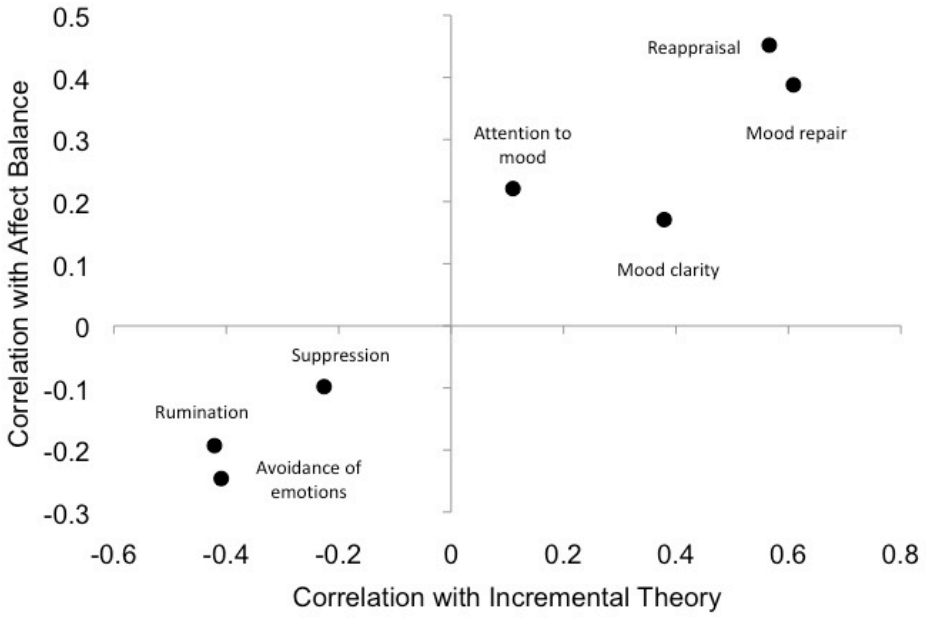


Figure 3. Relationship between hedonic profile of emotion regulation strategy and incremental theory of emotion.

Figure 4 shows the same pattern with coping strategies: The stronger a person's incremental beliefs are, the more likely they are to use coping strategies associated with

more positive and less negative affect (positive reframing, active coping, and planning) and the less likely they are to rely on coping strategies that are associated with more negative and less positive affect (behavioral disengagement, self-blame, and denial).

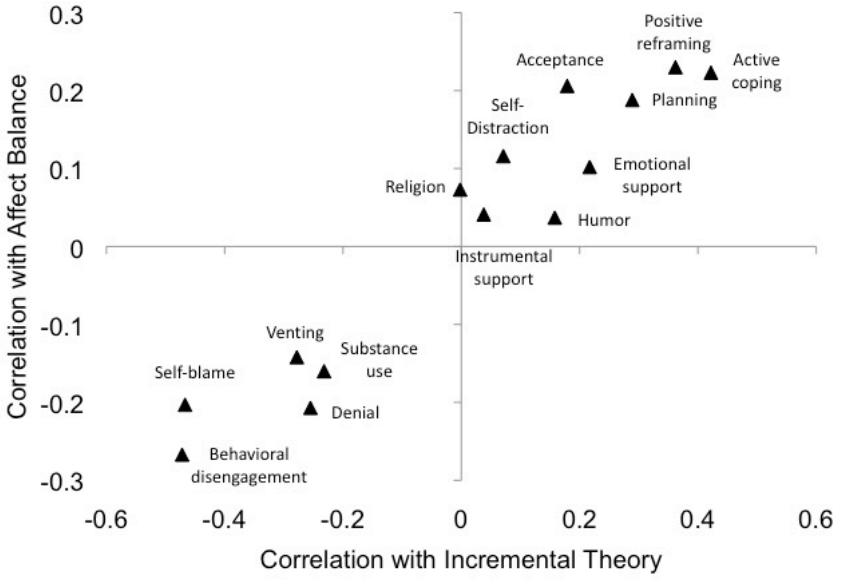


Figure 4. Relationship between hedonic profile of coping strategy and incremental theory of emotion.

Control Analyses

Unique Associations with Implicit Theories of Emotion. When controlling for implicit theories of intelligence, the pattern of correlations was generally the same. Although some correlations were reduced in size, all of the significant zero-order correlations remained significant (see Tables 4-9). This was also the case when controlling for implicit theories of intelligence and emotion regulation self-efficacy. In some cases, correlations with implicit theories became nonsignificant when controlling for locus of control, including neuroticism, several specific emotions (interest, love,

disgust, embarrassment, fear, etc.), depression, perceived stress, trait negative affect, and mood clarity, although all of these correlations were in the same direction as the original correlation, and may have been significant with a larger sample size. The correlation between implicit theories of emotion and BEQ emotional impulse strength was not significant, $r = .06$, $p = .40$, therefore, I do not report partial correlations controlling for emotional intensity.

Correction for Family-Wise Error. To correct for the number of analyses, the family-wise alpha level was set to $p < .001$. In this case, an incremental theory of emotion had significant positive zero-order correlations with agreeableness, conscientiousness, optimism, cognitive reappraisal, mood repair, attention to mood, emotion regulation self-efficacy, positive affect, amusement, hope, interest, joy, love, pride, environmental mastery, and self-esteem, as well as implicit theories of intelligence and academic self-efficacy. An incremental theory of emotion had significant negative correlations with neuroticism, behavioral disengagement, avoidance of emotions, perceived stress, depression, negative affect, anger, anxiety, contempt, embarrassment, loneliness, and sadness.

Mediation

Overview of Analyses. I examined two path models in which helpless- and mastery-oriented emotion regulation mediated the relationship between implicit theories and well-being. In the first model, I examined general approaches to emotion: mood repair and avoidance of emotion. In the second model, I examined specific strategies: cognitive reappraisal and behavioral disengagement. In both models, all paths were included and residuals were allowed to covary. The models were analyzed using MPlus

software (Muthén & Muthén, 2009). For both models, I predicted that the relationship between implicit theories of emotion and affect would be mediated by emotion regulation. Descriptive statistics are reported in Table 9.

Table 9. Descriptive statistics and inter-correlations for variables included in path models

Scale	Mean (SD)	1	2	3	4	5	6	7
1. Emotional Mindset	64.43 (13.17)	**.85**	.39	-.26	.45	-.26	.32	-.25
2. Mood Repair	63.44 (16.74)		**.80**	-.39	.64	-.42	.53	-.42
3. Emotional Avoidance	38.94 (15.26)			**.86**	-.32	.43	-.29	.35
4. Cognitive Reappraisal	63.67 (14.45)				**.82**	-.26	.56	-.32
5. Behavioral Disengagement	20.04 (20.87)					**.62**	-.28	.43
6. Positive Affect	61.71 (14.19)						**.85**	-.22
7. Negative Affect	34.07 (15.39)							**.86**

Note. Cronbach's alpha coefficients are reported in bold in diagonal. $N = 256$ for all variables except Behavioral Disengagement ($N = 183$).

General Approaches. Data were available for 256 participants. EMS predicted greater mood repair, $\beta = .39$, $t = 6.27$, $p < .001$ and lower emotional avoidance, $\beta = -.26$, $t = -4.12$, $p < .001$. Mood repair significantly predicted more positive affect, $\beta = .46$, $t = 7.32$, $p < .001$ and less negative affect, $\beta = -.30$, $t = -4.52$, $p < .001$. Avoidance of emotion predicted more negative affect $\beta = .22$, $t = 3.45$, $p < .001$, but was not significantly related to positive affect, $\beta = -.08$, $t = -1.42$, $p = .16$ (see Figure 5).

Bootstrapping analysis was used as a test of mediation, and showed that three of the four indirect paths were significant. Specifically, the relationship between implicit theories and positive affect was mediated by mood repair, $\beta = .18$ (SE = .03), $t = 5.25$, $p < .001$, but not by avoidance of emotion, $\beta = .02$ (SE = .02), $t = 1.33$, $p = .18$. The relationship between implicit theories and negative affect was mediated by both mood

repair, β = -.12 (*SE* = .03), *t* = -3.62, *p* < .001 and avoidance of emotion, β = -.06 (*SE* = .02), *t* = -2.57, *p* = .01. The direct effect of implicit theories of emotion on positive affect was significant, β = .12, *t* = 2.23, *p* = .03, but the direct effect on negative affect was not, β = -.08, *t* = 1.47, *p* = .14. These results indicate that the relationship between implicit theories and negative emotion was fully mediated by general approaches to emotion, and the relationship between implicit theories and positive emotion was partially mediated by mood repair, but not by avoidance of emotion.

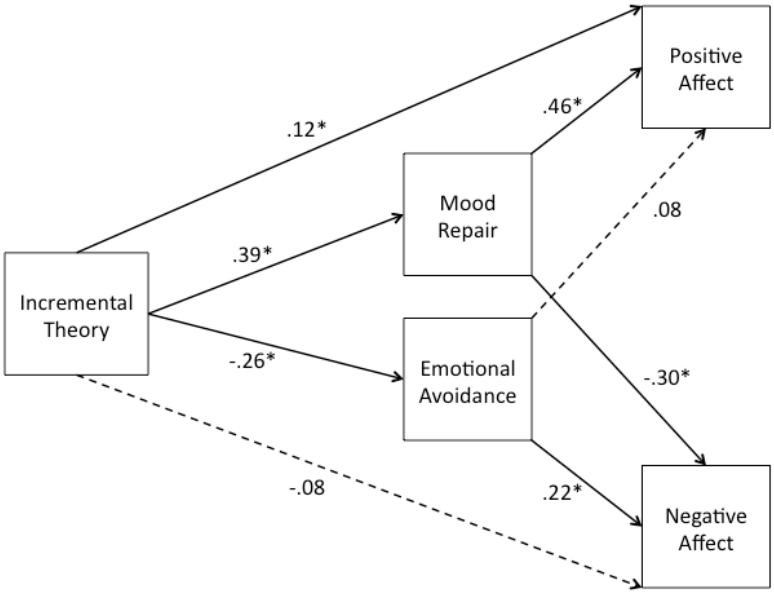


Figure 5. Path analysis of indirect effects of implicit theories of emotion on positive and negative affect by general approaches to emotion. Dashed lines indicate non-significant paths.

Specific Strategies. Data were available for 183 participants. The pattern was similar to the general model. EMS significantly predicted more cognitive reappraisal, β =

.43, $t = 5.68$, $p < .001$ and less behavioral disengagement, $\beta = -.26$, $t = -3.74$, $p < .001$. Cognitive reappraisal predicted more positive affect, $\beta = .52$, $t = 7.52$, $p < .001$ and less negative affect, $\beta = -.20$, $t = -2.62$, $p = .01$. Behavioral disengagement predicted more negative affect, $\beta = .35$, $t = 5.27$, $p < .001$, and marginally predicted less positive affect, $\beta = -.14$, $t = -1.90$, $p = .06$ (see Figure 6).

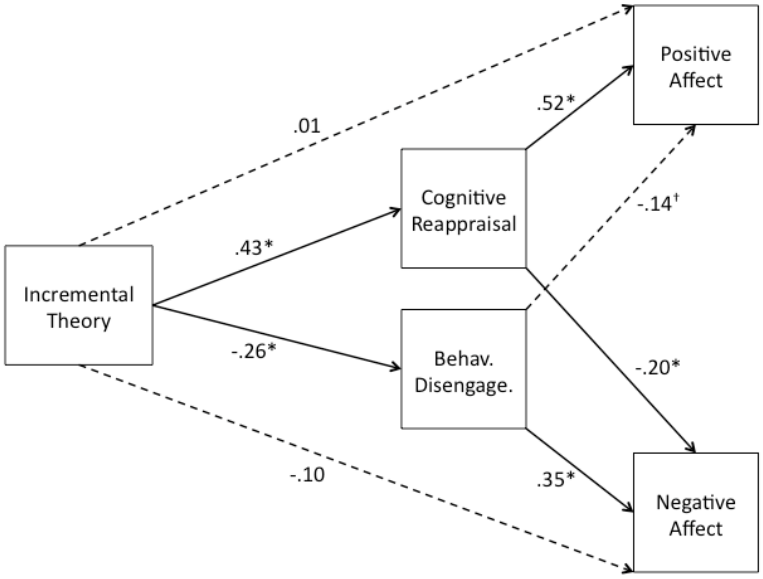


Figure 6. Path analysis of indirect effects of implicit theories of emotion on positive and negative affect by specific emotion regulation strategies. Dashed lines indicate non-significant paths.

Bootstrapping analysis was used as a test of mediation, and showed that all of the indirect paths were significant or marginally significant. Specifically, the relationship between implicit theories and positive affect was mediated by cognitive reappraisal, $\beta = .22$ ($SE = .04$), $t = 5.36$, $p < .001$, and was marginally significantly mediated by behavioral disengagement, $\beta = .04$ ($SE = .02$), $t = 1.76$, $p = .08$. The relationship between implicit theories and negative affect was mediated by cognitive reappraisal, $\beta = -.09$ (*SE*

= .04), t = -2.52, p = .01, and by disengagement, β = -.09 (*SE* = .03), t = -3.01, p = .003. The direct relationship between implicit theories and positive affect was not significant, β = .01, t = .10, p = .92, nor was the direct relationship between implicit theories and negative affect, β = -.10, t = -1.41, p = .16. This suggests that both relationships were fully mediated by emotion regulation.

Discussion

In Study 1, I developed and validated a questionnaire to assess individual differences in implicit theories of emotion, expanding on past research by improving internal consistency and content validity, by addressing beliefs about both negative and positive emotions. Using this scale, I showed that implicit theories of emotion are related to, but not redundant with implicit theories of intelligence, locus of control, and emotion regulation self-efficacy, and established discriminant validity by showing that for the most part, correlations between implicit theories of emotion and personality, emotional experience, and emotion regulation are significant even when controlling for these conceptually related variables. Implicit theories were unrelated to emotional intensity, suggesting that people who believe emotions are uncontrollable are not necessarily the ones who experience the strongest emotional impulses.

Replicating and extending past research, I showed that incremental theories—beliefs that emotions are malleable and controllable—are associated with a more positive profile of well-being: more positive emotion, less negative emotion, greater life satisfaction, higher self-esteem, a greater sense of environmental mastery, and lower depression and perceived stress. In addition, incremental theories were associated with more adaptive emotion regulation and coping strategies, including mood repair in

general, and greater use of cognitive reappraisal, active coping, positive reframing, and acceptance; and less maladaptive emotion regulation, including less avoidance of emotion, less rumination, behavioral disengagement and denial. This supports the hypothesis that incremental theorists are more likely to rely on active, mastery-oriented emotion regulation and less likely to rely on passive, helpless-oriented emotion regulation. Moreover, the relationship between implicit theories of emotion and emotional experience is mediated by use of mastery- and helpless-oriented strategies.

Self-report data measured at the trait level is useful for finding out how the variables covary in real life, and thus has higher external validity than other methods. Because of the correlational nature of this data, however, we cannot make any conclusions about the causal role of implicit theories of emotion on these outcome variables. In analyzing these relationships, I was able to show that relationships between implicit theories of emotion and emotion regulation and well-being were not merely due to implicit theories in general, locus of control, emotion regulation self-efficacy, or emotional intensity. In addition, the mediation model tentatively suggests a causal relationship between implicit theories and well-being. A correlational design, however, cannot rule out all possible third variables. As a next step, I designed an experimental manipulation of implicit theories of emotion, to examine the causal effects of implicit theories on emotional experience and emotion regulation.

CHAPTER III

STUDY 2: THE EFFECTS OF IMPLICIT THEORIES ON EMOTIONAL EXPERIENCE

Introduction

The purpose of Study 2 was to investigate the effects of implicit theories on emotional experience and spontaneous emotion regulation. Individual difference research has shown that an incremental theory is associated with a generally positive pattern of emotional experience and well-being, and that this is due in part to emotion regulation (Study 1; Tamir et al., 2007). The next step was to begin to test the causal relationships between implicit theories on the one hand, and emotional experience and emotion regulation on the other.

I first ran a pilot study to develop stimuli that could reliably manipulate implicit theories of emotion in a laboratory setting. Past research on implicit theories has used versions of popular-press style articles to present evidence as to the nature of personality (Dweck et al., 1995a) and morality (Chiu et al., 1997). I adapted such stimuli to present evidence of the fixed or malleable nature of emotions, and created two versions of an article, one entitled "Emotions are dynamic, changeable processes" (incremental condition), and the other entitled "Emotions are fixed, automatic processes" (entity condition). Both articles presented anecdotal, developmental, clinical, and brain imaging evidence to support the major thesis of the article; the articles were as similar as possible, and differed only in the results of the studies described (see Appendices C and D). In addition, where possible, evidence presented described real research, although the names of the researchers and affiliated institutions were fictionalized.

I then tested whether experimentally manipulating implicit theories of emotion would cause people to experience an emotional situation in different ways. Participants recorded their emotional experience while watching a sad movie scene, and then again during a "recovery" movie scene. First, I hypothesized that participants in the incremental condition would experience less negative affect during a negative emotional situation, compared to those in the entity condition. Second, I hypothesized that participants in the incremental condition would experience more favorable affect balance (more positive than negative affect) during the recovery period, and would recover more quickly after a negative experience than those in the entity condition, as measured by the slope of affect during the recovery video. Third, I hypothesized that participants in the incremental condition would be more likely to report using emotion regulation, and would report that their strategies were more effective, compared to participants in the entity condition.

Pilot Study

The purpose of the pilot study was to develop a method of experimentally manipulating implicit theories of emotion. A successful manipulation would produce group differences in implicit theories of emotion, but no differences in mood. Additionally, the two articles should be rated as equally informative, interesting, and persuasive.

Method

Data were collected from 59 undergraduate students from the human subject pool. Participants signed up for the study online and completed the study in the lab. After consenting to participate, participants were randomly assigned to either the entity (N =

25) or incremental (N = 34) condition[4], and read one of two *Psychology Today*-style articles that presented research evidence favoring either an entity or incremental view, described above (see Appendices C and D).

After reading the article, participants rated the extent to which they found the article interesting, informative, and persuasive, using a 7-point rating scale from "disagree strongly" to "agree strongly." They then completed the four items from Tamir et al.'s (2007) original implicit theories scale, which includes two entity and two incremental items, and rated their mood using a single item ("How are you feeling right now?") on a 7-point scale, which ranged from "very negative" to "very positive."

Results and Discussion

All dependent measures were transformed so that they ranged from a possible 0 to 100. Descriptive and inferential statistics are presented in Table 10. There were no differences in how interesting, informative, or persuasive participants in the entity condition found the article, compared to those in the incremental condition. There was also no difference in participants' moods: Entity participants (M = 62.00, SD = 22.32) and incremental participants (M = 63.13, SD = 18.98) were both, on average, in a slightly pleasant mood after reading the article, $t(56) = .21$, $p = .84$, $d = .05$.

A higher score on the four-item implicit theory of emotion scale indicates a stronger incremental theory. Participants in the incremental condition had a significantly higher score (M = 66.67, SD = 19.40) than those in the entity condition (M = 49.67, SD =

[4] Differences in sample sizes within the groups were due to true randomization.

17.47), indicating that the manipulation of implicit theories was successful, $t(56) = 3.45$, $p = .001$, $d = .92$.

Table 10. Manipulation check results in the pilot study

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Interesting	70.67 (20.00)	65.66 (23.55)	-.86	.40	-.23
Informative	80.67 (17.80)	75.76 (17.23)	-1.06	.29	-.28
Persuasive	64.00 (25.31)	62.12 (22.93)	-.30	.77	-.09
Mood	62.00 (22.32)	63.13 (18.98)	.21	.84	.05
Implicit Theory	49.67 (17.47)	66.67 (19.40)	3.45	.001	.92
N	25	34			

Consistent with past research in other domains, implicit theories of emotion can be experimentally manipulated, suggesting that implicit theories can exist as an individual difference, but can also be shifted temporarily. This is an important step in investigating the causal effects of implicit theories on cognition, emotion, and behavior, which was a major goal of Studies 2-5.

Study 2 Method

Participants

Participants were 146 undergraduate students from the University of Oregon human subject pool who participated in this study in exchange for credit toward an introductory psychology or linguistics class (110 females, 36 males; 81% White, 12% Asian-American, 4% Hispanic, 3% other). The average age was 20.83 ($SD = 5.24$, range 17 to 49). Participants signed up for the study online, knowing only that it was a two-part study (15 minutes online, 45 in the laboratory). Data from four participants were excluded because they did not properly use the rating dial in Part 2 (there was no variance in online mood ratings), leaving full data for 142 participants.

Part 1: Pre-Laboratory Session

In a 15-minute online session before reporting to the lab, participants completed a series of individual difference measures, including the Berkeley Expressivity Questionnaire, the Big Five Inventory, the Emotion Regulation Questionnaire, and a Locus of Control measure, as described in Study 1. They also completed the 12-item EMS and a four-item measure of implicit theories of intelligence, as well as demographic variables. Participants completed Part 1 online at their convenience, but were told that they were required to complete it before reporting to the lab, and were encouraged to do so as soon as possible. On average, there were 5.90 (SD = 5.06) days between sessions (range 0 to 29, with a median of 5.5).

Part 2: Laboratory Session

Participants were run up to four at a time. Upon reporting to the laboratory, participants read and signed a consent form, and were seated at one of four computers, which were spaced so that no participant could see what was on the other screens. They were told that the laboratory portion of the study consisted of three parts. In the first part, they would read and evaluate an article that included research conducted at the University of Oregon. Then, they would watch and rate a series of short videos, after which they would complete a recall test about the article they had read.

Assignment of Condition. Participants were randomly assigned to either an entity (n = 65) or incremental condition (n = 77)[5], and read a printed version of one of the

[5] Differences in group size were due to the randomization process.

articles described above. They were also randomly assigned to either the neutral recovery condition (n = 67) or the positive recovery condition (n = 75).

Reading and Manipulation Checks. Participants answered two open-ended questions after reading the article: "In 2-3 sentences, please summarize the main points of this article." and "Name three kinds of evidence used to support this main point. In your opinion, what is the most compelling evidence presented in this article?" They also rated the extent to which they thought the article was interesting, informative, and persuasive, on a 1 ("disagree strongly") to 7 ("agree strongly") scale. They then completed the four-item implicit theories of emotion questionnaire (Tamir et al., 2007), and rated their current mood from 1 ("very negative") to 7 ("very positive").

Movie Ratings. Participants were then introduced to the movie-rating task. They were told that they would be using their mouse to track their feelings for the entire time they watched each video. The rating scale ranged from negative on the left to positive on the right, and appeared on the same screen as the video clip, using MediaLab software (Jarvis, 2004). Participants wore headphones throughout this process.

The first video was a 30-second clip of a screensaver depicting colored lines appearing and disappearing. After the video, participants rated how confident they were in being able to rate their feelings while watching the next video, on a scale from 1 ("not at all confident") to 7 ("very confident"). This video was considered a training period, and was not included in analyses.

The second video was a 3-minute clip from *The Champ,* depicting a scene in which a young boy witnesses the death of his father after a boxing fight. This clip elicits sadness in participants (Rottenberg, Ray, & Gross, 2004). Participants rated their feelings

during this video using the sliding scale, and afterwards completed a post-video questionnaire adapted from Rottenberg et al., (2004). This questionnaire asked them how much they felt each of several emotions—including amusement, fear, happiness, interest, sadness, and unhappiness—on a 0 ("not at all/none") to 8 ("extremely/a great deal").

Participants then watched either a neutral video or an amusing video as the recovery video. The neutral video was a scene from *Alaska's Wild Denali,* depicting nature scenes of Alaska. The amusing video was a scene from *When Harry Met Sally,* in which the female character pretends to experience an orgasm while in a crowded restaurant. Each of these videos was about three minutes long, and elicits neutral or mildly pleasant feelings, and amusement, respectively (Rottenberg et al., 2004). Participants again rated their feelings during this video using the sliding scale, and completed the same questionnaire described above.

Reading Comprehension and Recall. After rating all of the movies, participants answered three open-ended questions, in which they were asked to recall the title, main point, and evidence presented in the article they read earlier in the session.

Self-Reported Emotion Regulation. At the end of the study, but before debriefing, participants wrote down what they thought the purpose of the study was, as well as whether they engaged in any efforts to change their emotions, and whether those efforts were successful. All participants were debriefed by the researcher, who described the true purpose of the study, and answered any questions the participants had. Participants also received an extended article on the most up-to-date research on the malleability of emotions, which provided evidence for both the automaticity and flexibility of emotion and emotion regulation, using much of the same research presented

in the fictitious articles, but using the researchers' real names, and providing references for further reading.

Results

Manipulation Checks

Implicit Theories of Emotion. Manipulation check statistics are reported in Table 11. All continuous variables were transformed so that they ranged from a possible 0 to a possible 100. There were no significant differences in how interesting, informative, or persuasive participants in the entity condition found the article, compared to those in the incremental condition. Entity participants (M = 61.28, SD = 21.87) and incremental participants (M = 64.29, SD = 20.00) were both, on average, in a slightly pleasant mood after reading the article (before the film clips), but did not differ from each other, $t(140)$ = .85 p = .39, d = .14. Participants in the incremental condition (M = 74.10, SD = 21.38) had significantly higher implicit theory scores than those in the entity condition (M = 49.81, SD = 18.94), indicating that the manipulation of implicit theories was successful, $t(140) = 7.11$ $p < .001$, d = 1.20.

Table 11. Manipulation check results in Study 2

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Interesting	81.15 (16.55)	79.54 (18.01)	-.55	.58	-.09
Informative	79.23 (19.55)	81.49 (15.92)	.76	.45	.13
Persuasive	66.53 (24.71)	69.48 (20.53)	.78	.44	.13
Mood	61.28 (21.87)	64.29 (20.00)	.85	.39	.14
Implicit Theory	49.81 (18.94)	74.10 (21.38)	7.11	< .001	1.20
N	65	77			

Movie Valence. Criterion variables for the movie valence manipulation check were drawn from the post-video questionnaire. Comparison between the negative video

and the recovery videos (neutral and positive) was made using paired-sample t-tests. Participants who viewed the negative and neutral movies felt significantly more sadness after watching the negative video ($M = 7.64$, $SD = 1.43$) than after watching the neutral video ($M = 1.57$, $SD = 1.38$), $t(66) = 27.32$, $p < .001$, $d = 3.11$. Participants who viewed the negative and positive movies also felt significantly more sadness after watching the negative video ($M = 7.68$, $SD = 1.54$) than after watching the positive video ($M = 1.28$, $SD = .65$), $t(73) = 34.86$, $p < .001$, $d = 4.48$.

Independent groups t-tests compared experienced emotions between the two recovery conditions. Participants who watched the positive video felt significantly more amusement ($M = 7.38$, $SD = 1.68$) than those who watched the neutral video ($M = 4.93$, $SD = 2.09$), $t(139) = -7.72$, $p < .001$, $d = 1.30$. Participants who watched the neutral video also felt marginally more sadness ($M = 1.57$, $SD = 1.17$) than those who watched the positive video ($M = 1.28$, $SD = .66$), $t(139) = 1.80$, $p = .07$, $d = .32$. Thus, the positive video appeared to elicit a more clearly positive emotional experience, compared to the neutral video.

Hypothesis 1: Emotional Experience During the Negative Video

The first hypothesis was that participants in the incremental condition would experience less negative affect than those in the entity condition. This was tested three ways. First, I examined whether participants differed on their self-rated experience of sadness after the movie. Entity participants ($M = 7.62$, $SD = 1.55$) and incremental participants ($M = 7.84$, $SD = 1.24$) did not differ in their self-reported sadness, $t(140) = .96$, $p = .33$, $d = .16$. Second, I examined whether participants differed in their aggregated (mean) online affect ratings over the course of the three-minute video. Entity participants

(M = -2.25, SD = .91) and incremental participants (M = -2.26, SD = 1.06) did not differ in their aggregated mean online ratings during the sad video, $t(140) = -.05$, $p = .96$, $d = -.01$. These results are reported in Table 12.

Table 12. Emotional experience during negative video

	Entity	Incremental	*t*	*p*	*d*
Self-report sadness	7.62 (1.55)	7.84 (1.24)	.96	.33	.16
Aggregated affect	-2.25 (.91)	-2.26 (1.06)	-.05	.96	-.01
N	65	77			

Third, I examined the slope at which participants declined in affect over the course of the video. Affect ratings were grouped into 10-second segments. Affect was entered as the dependent variable, using the model below using HLM 7 software (Raudenbush, Bryk, & Congdon, 2010). Linear and quadratic effects of time were modeled as Level 2 predictors, and implicit theory condition was modeled as a Level 1 predictor, with the entity condition coded as 0 and the incremental condition coded as 1.

$$\text{AFFECT} = \beta_{0i} + \beta_{1i}(\text{time}) + \beta_{2i}(\text{time}^2) + r_{ij}$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{theory}) + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{theory}) + u_{1i}$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21}(\text{theory}) + u_{2i}$$

There was a significant linear effect of time, such that affect became more negative over time, $\gamma = -.43$ (SE = .03), $t(138) = -16.64$, $p < .001$, as well as a significant quadratic effect, $\gamma = .02$ ($SE < .00$), $t(138) = 12.06$, $p < .001$. There was no main effect of implicit theory condition, and theory condition did not significantly interact with time

(see Table 13 and Figure 7). Thus, the hypothesis that incremental participants would experience less negative affect than entity participants was not supported.

Table 13. Fixed and random effects in multi-level modeling (negative video)

Fixed Effects			
	Coefficient	*SE*	*t*
Intercept γ_{00}	.05	.09	.56
Linear Effect: Time γ_{10}	-.43	.03	-16.64***
Quadratic Effect: Time^2 γ_{20}	.02	.00	12.06***
Theory γ_{01}	.00	.12	.03
Theory*Time γ_{11}	-.03	.04	-.77
Theory*Time^2 γ_{21}	.00	.00	1.33
Random Effects			
	Variance Component	df	χ^2
Intercept u_{0i}	.42	138	689.86***
Linear Effect u_{1i}	.04	138	976.74***
Quadratic Effect u_{2i}	.00	138	904.05***
Level 1 r_{ij}	.17		

*** $p < .001$.

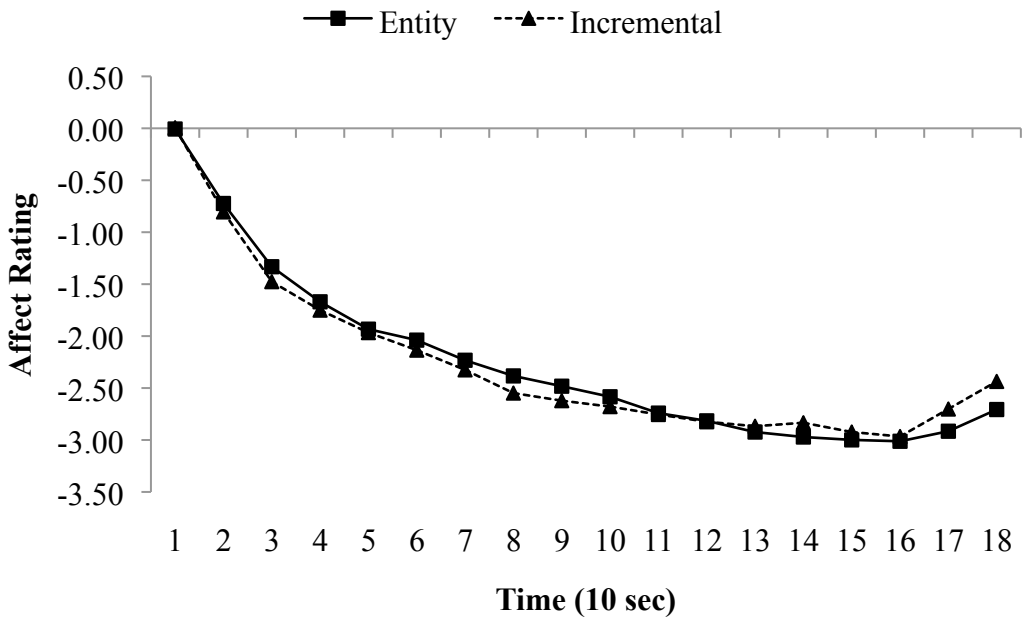


Figure 7. Average continuous online affect ratings during negative video.

Hypothesis 2: Recovery From Negative Affect

The second hypothesis was that participants in the incremental condition would experience a more favorable affect balance and would recover more quickly during the recovery video. This was measured in three ways. First, I examined the self-reported sadness and happiness that participants rated after the recovery video. Second, I examined the mean aggregated online affect ratings for the recovery videos. Third, I examined the slopes of online affect ratings over the course of the video. Analyses were conducted separately for the neutral and positive recovery videos.

Neutral Recovery. Entity participants and incremental participants did not differ in the amount of sadness, happiness, or amusement that they experienced during the neutral recovery film, *t*'s = -.67 to .44, *p*'s > .50. They also did not differ in the mean aggregated online ratings, $t(65) = -.32$, $p = .75$. These results are reported in Table 14.

Table 14. Emotional experience during neutral video

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Sadness	1.69 (1.26)	1.55 (1.25)	-.44	.66	-.11
Happiness	5.83 (1.77)	6.11 (1.80)	.63	.53	.16
Amusement	4.90 (2.04)	5.24 (2.06)	.67	.50	.17
Aggregated mean	1.29 (1.00)	1.37 (.92)	.32	.75	.09
N	29	38			

The same multi-level model described above was used for analyzing the affect ratings over time in the neutral video. There was a significant linear effect of time, such that positive affect increased over time, $\gamma = .16$ ($SE = .05$), $t(65) = 3.41$, $p < .001$. The quadratic effect was marginally significant, $\gamma = -.004$ ($SE = .002$), $t(65) = -1.83$, $p = .07$.

There was no main effect of implicit theory condition, and theory condition did not significantly interact with time (see Table 15 and Figure 8).

Table 15. Fixed and random effects in multi-level modeling (neutral video)

Fixed Effects			
	Coefficient	*SE*	*t*
Intercept γ_{00}	.35	.14	2.59*
Linear Effect: Time γ_{10}	.16	.05	3.41**
Quadratic Effect: Time^2 γ_{20}	-.004	.002	-1.83†
Theory γ_{01}	.12	.18	.10
Theory*Time γ_{11}	.01	.06	.09
Theory*Time^2 γ_{21}	.00	.00	.02

Random Effects			
	Variance Component	df	χ^2
Intercept u_{0i}	.38	65	231.39***
Linear Effect u_{1i}	.05	65	406.95***
Quadratic Effect u_{2i}	.00	65	375.30***
Level 1 r_{ij}	.22		

† $p < .08$. * $p < .05$. ** $p < .01$. *** $p < .001$.

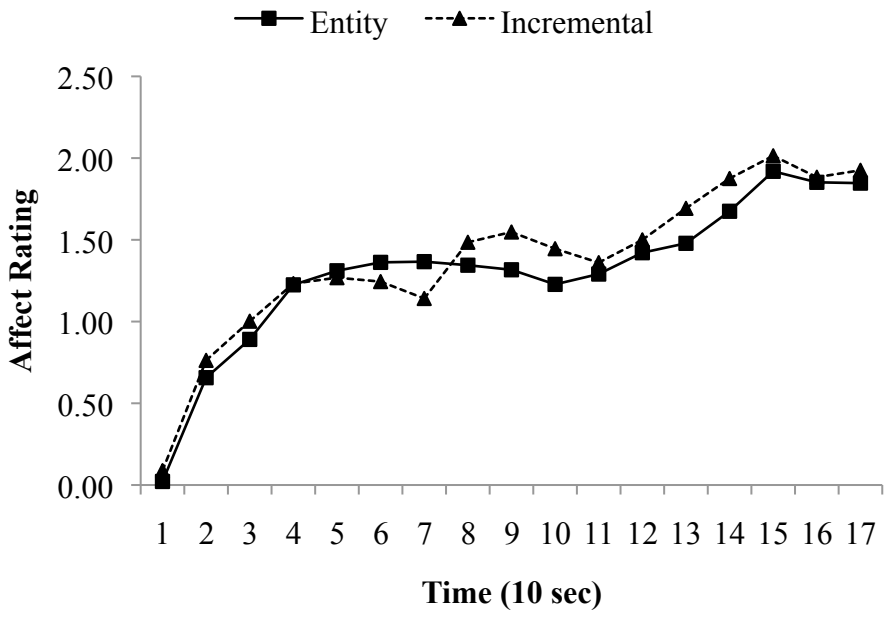


Figure 8. Average continuous online affect ratings during the neutral recovery video.

Positive Recovery. Entity participants and incremental participants did not differ in the amount of sadness, happiness, or amusement that they experienced during the positive recovery film, *t*'s = -.38 to .93, *p*'s > .35. They also did not differ in the mean aggregated online ratings, $t(73) = -.92$, $p = .36$. These results are reported in Table 16.

Table 16. Emotional experience during positive recovery video

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Sadness	1.25 (.60)	1.31 (.69)	.38	.70	.09
Happiness	6.19 (1.67)	5.82 (1.82)	-.93	.35	-.21
Amusement	7.56 (1.48)	7.49 (1.52)	-.20	.84	-.05
Aggregated mean	1.45 (1.07)	1.22 (1.10)	-.92	.36	-.21
N	36	39			

The same multi-level model described above was used for analyzing the positive video. There was a significant linear effect of time, such that positive affect increased over time, $\gamma = .20$ ($SE = .04$), $t(71) = 5.01$, $p < .001$, as well as a significant quadratic effect, $\gamma = -.004$ ($SE = .002$), $t(71) = -2.22$, $p = .03$. There was no main effect of implicit theory condition, and theory condition did not significantly interact with time (see Table 17 and Figure 9). Thus, the hypothesis that incremental participants would experience more positive affect and would recover more quickly was not supported.

Table 17. Fixed and random effects in multi-level modeling (positive video)

Fixed Effects			
	Coefficient	*SE*	*t*
Intercept γ_{00}	.22	.13	1.75†
Linear Effect: Time γ_{10}	.20	.04	5.01***
Quadratic Effect: Time^2 γ_{20}	-.005	.002	-2.22*
Theory γ_{01}	.14	.18	.64
Theory*Time γ_{11}	-.02	.05	-.40
Theory*Time^2 γ_{21}	-.002	.003	-.50

Table 17 (continued). Fixed and random effects in multi-level modeling (positive video)

Random Effects			
	Variance Component	df	χ^2
Intercept u_{0i}	.36	71	189.37***
Linear Effect u_{1i}	.04	71	273.97***
Quadratic Effect u_{2i}	.00	71	298.35***
Level 1 r_{ij}	.22		

† $p < .08$. * $p < .05$. *** $p < .001$.

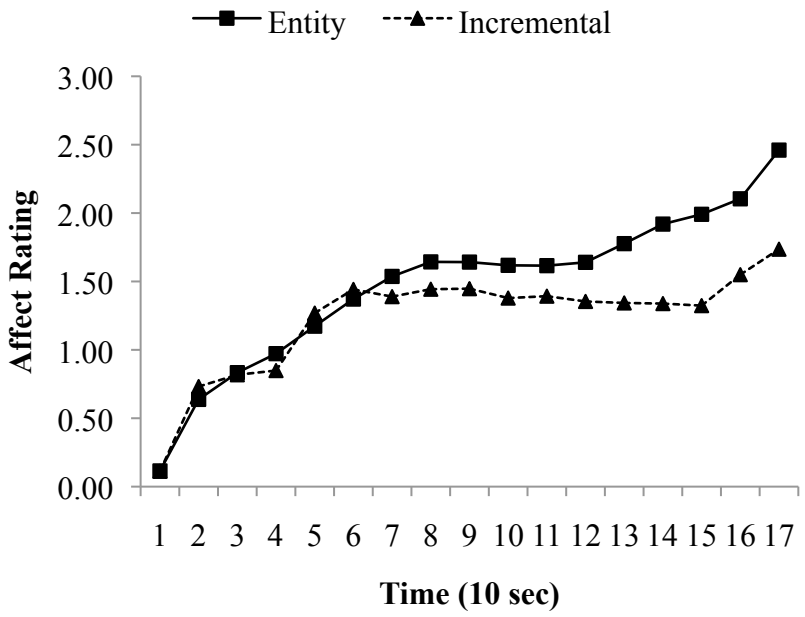


Figure 9. Average continuous online affect ratings during the positive recovery video.

Hypothesis 3: Self-Reported Emotion Regulation

The third hypothesis was that participants in the incremental condition would report using more emotion regulation, and that they would rate their emotion regulation attempts as more successful. At the end of the study, participants indicated whether they had made any efforts to change the emotions that they felt, and described how they had

done so, and how successful they thought they were. Trained research assistants coded the responses. Emotion regulation was coded as either 1 (yes) or 0 (no). The directionality of the emotion regulation attempt (increase or decrease) and the valence of the emotions targeted (positive or negative) were also noted. Self-reported success was coded as 1 (not successful), 2 (somewhat successful), or 3 (yes, successful).

The number of participants in each condition who used emotion regulation is reported in Table 18, which includes the specific goals of regulation. A total of 94 participants reported engaging in some form of emotion regulation. Of these, 41 were in the entity condition, and 43 were in the incremental condition. This difference was nonsignificant, $\chi^2(1) = .05$, $p = .83$. Moreover, participants in the incremental condition ($M = 2.19$, $SD = .81$) did not rate their emotion regulation as more successful than those in the entity condition ($M = 1.91$, $SD = .78$), $t(70) = 1.46$, $p = .15$, although there was a small effect in the hypothesized direction, $d = .35$. Thus, the hypothesis that participants in the incremental condition would be more likely to regulate their emotions was not generally supported.

Table 18. Number and percentage of participants reporting use of emotion regulation within each group

	Condition	
	Entity	Incremental
	N (%)	*N* (%)
Neutral recovery		
Decrease negative	7 (24)	7 (18)
Increase negative	10 (42)	8 (21)
Increase positive	7 (24)	4 (11)
Decrease positive	0 (0)	0 (0)
Total emotion regulation	17 (59)	21 (55)

Table 18 (continued). Number and percentage of participants reporting use of emotion regulation within each group

	Condition	
	Entity	Incremental
	N (%)	*N* (%)
Positive recovery		
Decrease negative	10 (28)	16 (41)
Increase negative	8 (22)	4 (10)
Increase positive	4 (11)	2 (5)
Decrease positive	0 (0)	3 (8)
Total emotion regulation	24 (67)	22 (56)
Total decrease negative	17 (26)	23 (30)
Total increase negative	18 (28)	12 (16)
Total increase positive	11 (17)	6 (8)
Total decrease positive	0 (0)	3 (4)
Total emotion regulation	41 (63)	43 (56)

Note. Totals reflect number of individuals who reported regulating emotions, who may have had multiple goals. Percentages are presented in parentheses.

Follow-Up Analyses

Additional follow-up analyses are presented in Appendix E. I examined 1) the peaks and ends of each video to see whether incremental and entity participants differed in their most intense affect, and in the affect at the end of each movie, 2) whether individual differences in implicit theories of emotion (EMS) predicted any of the dependent variables, 3) whether results remained the same when controlling for individual differences measured in part 1, and 4) whether those individual differences moderated any of the effects.

Discussion

This study investigated the effects of beliefs about the malleability of emotions on emotional experience and emotion regulation. Specifically, I examined how leading a

person to believe emotions are uncontrollable vs. controllable influenced their emotional reactions to a sad video, followed by either a neutral (mildly pleasant) video or a positive (amusing) video. I had hypothesized that an incremental theory would be associated with a more positive affective experience overall, including a more positive affect balance and quicker recovery from negative emotion, and that it would also be associated with greater emotion regulation.

These hypotheses were not supported. Participants in the entity and incremental conditions did not differ in their experience of negative affect during the sad video, as measured by aggregated mean affect ratings during the movie, the slope at which affect decreased over time, or global self-report after the movie. They also did not differ in their experience of affect during either the neutral or the amusing recovery video. Finally, participants in the entity and incremental conditions did not differ in their self-reported use of emotion regulation during these emotion-eliciting videos.

In examining open-ended reports of emotion regulation after the fact, it appears that participants varied in what they were attempting to do and feel within the situation, and that these goals did not differ systematically between entity and incremental groups. Explicitly, participants were asked to rate their emotions while watching video clips, but many people had individual goals within the situation as well. Several participants mentioned up-regulating negative emotions because they felt they were supposed to feel more sadness in response to the boy's grief at his father's death (responding to task demands). Others mentioned down-regulating negative emotions because they did not want to show sadness in the presence of a researcher (social goals), or because they did not want to feel sad for personal reasons (hedonistic goals). This does not entirely explain

why there were equal numbers of attempts in entity and incremental conditions, but it does suggest that the effects of implicit theories of emotion might depend on clear contextual demands. This issue will be addressed in Study 3 by providing participants with an explicit goal.

It is also possible that methodological choices or limitations contributed to the failure to detect differences between the groups. For example, several participants discussed idiosyncratic responses to the videos that influenced either their emotional experience, their emotion regulation, or both (e.g., a few participants grew up in Alaska and had strong positive reactions to the *Denali* video, several participants reported feeling embarrassment in response to the orgasm scene from *When Harry Met Sally,* and some participants brought up the recent death of a family member when discussing *The Champ*).

Study 3 was designed to explicitly investigate emotion regulation, and therefore addressed several of these limitations. First, participants rated a range of stimuli, which would help reduce the influence of idiosyncratic responses to any particular stimulus. Second, in Study 3, the situational goals were more explicit. Rather than investigating spontaneous emotion regulation, as I did in Study 2, I asked participants to try to remain objective while rating emotion-eliciting images, and also while attending to them and feeling their emotions naturally. This within-subjects contrast could help us understand how implicit theories of emotion interact with situational characteristics.

Study 2 suggests that people who have read evidence for emotion malleability are not any more likely than those who have read evidence for emotional uncontrollability to engage in spontaneous emotion regulation. When faced with a demanding situation in

which the goals are clear, however, incremental participants might be more likely to attempt to change their emotions to be in line with the situational demands, because they believe their emotions are changeable. On the other hand, entity participants might be less likely to try to change their emotions, because they believe they are helpless to change them. These hypotheses were examined in Study 3.

CHAPTER IV

STUDY 3: THE EFFECTS OF IMPLICIT THEORIES ON EMOTION REGULATION

Introduction

The purpose of Study 3 was to examine the effects of implicit theories of emotion on emotion regulation. The main question was whether those individuals with an incremental theory are more likely to use emotion regulation, compared to those with an entity theory. In Study 1, I found that trait incremental beliefs are associated with greater use of effective emotion regulation strategies, and greater cognitive reappraisal in particular (see also Tamir et al., 2007). This may be because an incremental theory encourages the use of active emotion regulation strategies; if a person believes that emotions are changeable, they will be more likely to try to change them when necessary. However, it could also be that individuals who engage in effective regulation strategies develop an incremental theory over time. To test whether implicit theories of emotion cause differences in emotion regulation, I experimentally manipulated implicit theories of emotion and emotion regulation goals.

Study 2 failed to find a difference between entity and incremental participants in spontaneous emotion regulation during an emotion-eliciting task. Post-experimental feedback from participants suggested that this was due at least in part to the fact that participants in both conditions had diverse emotion-related goals regarding the situation: some to up-regulate and some to down-regulate, whereas others did not attempt to change their emotions at all. Therefore, in Study 3, I sought to provide a context in which the goal was explicit, and emotion regulation would aid them in the goal.

In this study, participants rated emotionally positive, negative, and neutral pictures while either attending naturally to the pictures or attempting to remain objective (manipulated within subjects in a counter-balanced order). Study 2 suggested that implicit theories of emotion might not influence emotional experience when people are able to experience their emotions naturally. I predict, however, that those who believe emotions are malleable and controllable should be more likely to try to influence their own emotions when the situation calls for it. On the other hand, I predict that those who believe emotions are uncontrollable will have similar emotional experiences across conditions, regardless of whether they are expected to regulate their emotions or not. The major hypothesis of this study was that when viewing emotionally valenced pictures (positive or negative), those in the incremental condition would experience more neutral affect in the reappraise (remain objective) condition compared to the attend (watch naturally) condition, whereas those in the entity condition would experience similar affect in both conditions, regardless of situational cues to regulate.

Method

Participants

Participants were 94 undergraduate students (58 female, 36 male; 87.2% Caucasian, 6.4% Black/African-American, 11.7% Asian/Asian-American, 5% other) from the University of Oregon human subject pool who participated in exchange for credit toward an introductory psychology or linguistics class. The average age was 19.98 (*SD* = 2.93, range 18 to 42). Participants signed up for the study online, knowing only that it was a two-part study (15 minutes online, 45 in the laboratory). Before coming into

the lab, participants completed the same individual difference measures as in Study 2. On average, there were 2.9 days between sessions (range: 0 to 12, median 2 days).

Procedure

Participants were run up to four at a time. Upon reporting to the laboratory, participants read and signed a consent form, and were seated at one of four computers, which were spaced so that no participant could see what was on the other screens. They were told that the laboratory portion of the study consisted of three parts. In the first part, they would read and evaluate an article that included research conducted at the University of Oregon. Then, they would rate a series of pictures, after which they would complete a recall test about the article they had read.

Assignment of Condition. Participants were randomly assigned to either an entity (n = 48) or incremental (n = 45) condition. The manipulation of implicit theories and the reading and manipulation checks were the same as in Study 2.

Picture Ratings. Each participant saw both attend and reappraise conditions; order was counterbalanced between participants. In the attend condition, participants were instructed to "please attend carefully to each picture and rate how each picture makes you feel as you look at it." In the reappraise block, they were instructed to

> Try to increase your sense of objective distance, viewing pictured events from a detached, third-person perspective, as if you were a medical professional, historian, or journalist. For example, you may do this by imagining the scenes as less personally relevant, as unreal, or as physically farther away from yourself. Use the strategy you find most personally effective in maintaining objectivity.

These instructions were adapted from Ochsner, Ray, Cooper, Robertson, Chopra, Gabrieli, & Gross (2002), and were phrased to avoid direct references to emotion, and instead focused on cognitive control with emotional implications.

Within each block, participants were presented with 375 x 500 pixel images using MediaLab software (Jarvis, 2004). The first sentence of the attend or reappraise instructions were repeated above each picture, and below, participants were presented with the question "How does this picture make you feel?" Responses ranged from 1 "very negative" to 7 "very positive." Within each block, there were 15 positive, 15 neutral, 15 and negative pictures, for a total of 90 pictures, presented in a randomized order. Pictures were chosen from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1995), which has pre-established norms for valence. Positive pictures had ratings above 7 on the 8-point scale, negative pictures had ratings below 2, and neutral pictures had ratings between 4 and 5.

Reading Comprehension and Recall. Reading comprehension and recall questions were the same as in Study 2. After they were done, participants were debriefed by the researcher as in Study 2.

Results

Manipulation Checks

There were no significant differences in how interesting, informative, or persuasive participants in the entity condition found the article, compared to those in the incremental condition (see Table 19). There was also no difference in participants' moods: Entity participants (M = 68.06, SD = 17.81) and incremental participants (M = 69.63, SD = 20.81) were both, on average, in a slightly pleasant mood after reading the article, $t(91) = .39$, $p = .70$, $d = .08$. Participants in the incremental condition (M = 74.81, SD = 15.46) had significantly higher scores on the implicit theories of emotion measure

than those in the entity condition (M = 51.04, SD = 19.83), indicating that the manipulation of implicit theories was successful, $t(91) = 6.42$, $p < .001$, $d = 1.34$.

Table 19. Manipulation check results in Study 3

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Interesting	78.47 (11.89)	72.96 (20.50)	-1.60	.11	-.33
Informative	77.08 (15.61)	78.52 (13.11)	.48	.63	.10
Persuasive	66.31 (19.50)	71.11 (16.82)	1.26	.21	.26
Mood	68.06 (17.81)	69.63 (20.81)	.39	.70	.08
Implicit Theory	51.04 (19.83)	74.81 (15.46)	6.42	<.001	1.34
N	48	45			

Main Analyses

Affect ratings were recoded so that they ranged from a possible 0 to a possible 100, with a higher number indicated more positive emotion, and 50 as the mid-point, indicating neutral affect. Implicit theory (entity, incremental) was entered as a between-subjects variable into a repeated measures ANOVA; emotion regulation instructions (attend, reappraise) and picture block valence (negative, neutral, positive) were entered as within-subjects variables. Means and standard deviations for each of the groups are presented in Table 20.

As expected, the main effect of valence was significant, $F(2,182) = 1004.07$, $p < .001$. Simple contrasts showed that positive pictures (M = 74.93, SD = 8.60) were rated as more positive than neutral pictures (M = 53.22, SD = 4.85), $F(1,92) = 733.64$, $p < .001$. Negative pictures (M = 20.32, SD = 9.06) were rated as more negative than neutral pictures, $F(1,92) = 925.17$, $p < .001$. This suggests that the stimuli elicited the emotions that they were intended to elicit.

Table 20. Descriptive statistics for picture ratings

		Picture Valence			
		Negative	Neutral	Positive	Total
Incremental	Att.	16.47 (7.57)	52.31 (5.45)	76.75 (8.80)	48.51 (3.94)
	Rea.	22.99 (13.35)	55.65 (6.47)	73.91 (11.87)	50.85 (5.32)
	Total	20.88 (9.83)	53.98 (4.77)	75.33 (8.68)	49.68 (3.91)
Entity	Att.	18.97 (8.96)	52.18 (5.86)	76.23 (8.48)	49.13 (4.02)
	Rea.	22.76 (12.73)	52.82 (6.47)	72.87 (11.44)	49.49 (3.78)
	Total	20.88 (9.83)	52.50 (4.86)	75.33 (8.60)	49.31 (3.43)
Total	Att.	17.77 (8.37)	52.24 (5.61)	76.48 (8.59)	48.83 (3.94)
	Rea.	22.87 (12.97)	54.19 (6.10)	73.37 (11.60)	50.14 (4.61)
	Total	20.32 (9.06)	53.22 (4.85)	74.93 (8.60)	49.49 (3.65)

Note. Standard deviations are reported in parentheses. Att. = Attend condition; Rea. = Reappraise condition

There was also a significant main effect of emotion regulation instructions: Pictures were rated slightly more negative in the attend condition ($M = 48.83$, $SD = 4.02$) than in the reappraise condition ($M = 50.14$, $SD = 4.61$), $F(1,91) = 8.65$, $p = .004$. This was qualified by a significant interaction between valence and instruction, however, $F(2,91) = 12.68$, $p < .001$. Specifically, participants rated negative pictures more negatively in the attend condition, and positive pictures more positively in the attend condition, compared to the reappraise condition, whereas the difference between attend and reappraise was smaller in the neutral condition (see Figure 10).

The main effect of implicit theory was nonsignificant, as was the two-way interaction between valence and theory. In other words, collapsing across valence and instruction, there were no overall differences in picture ratings between entity ($M = 49.31$, $SD = 3.43$) and incremental participants ($M = 49.68$, $SD = 3.91$), $F(1,91) = .24$, $p = .63$.

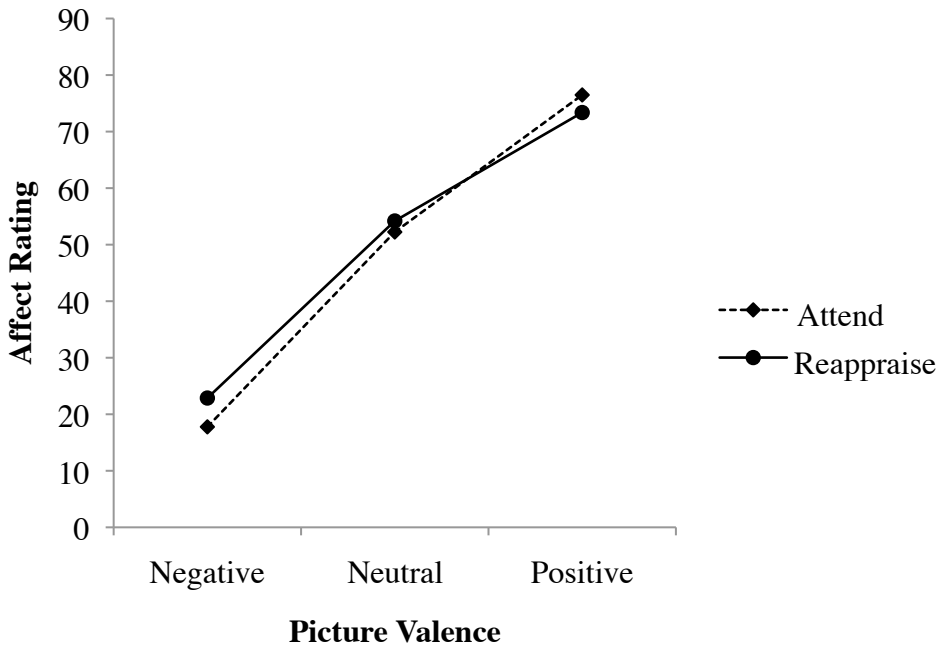


Figure 10. Interaction between valence and instruction

The major hypothesis of this study was that there would be an interaction between implicit theory and emotion regulation, such that emotion regulation instructions would only influence ratings of emotional pictures when participants held incremental beliefs. The two-way interaction between implicit theory and emotion regulation instructions was significant, $F(1,91) = 4.73$, $p = .03$. There was a larger difference between attend and reappraisal instructions for participants in the incremental condition, compared to those in the entity condition (see Figure 11). Thus, the main hypothesis was supported. The three-way interaction between theory, instructions, and valence was nonsignificant, indicating that this effect did not differ among negative, neutral, and positive pictures.

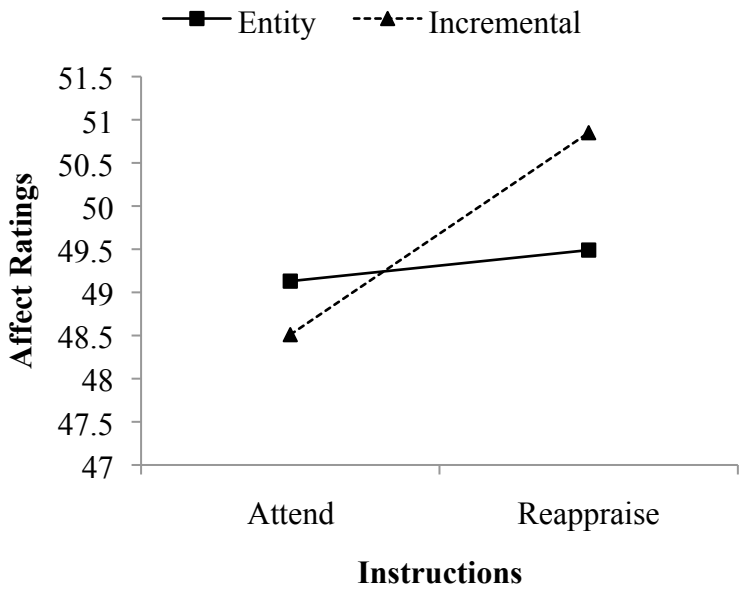


Figure 11. Interaction between implicit theory of emotion and regulation instructions

Follow-Up Analyses

Additional follow-up analyses are presented in Appendix F. I examined 1) correlations between affect ratings in the reappraise and attend conditions for incremental and entity participants, 2) whether individual differences in implicit theories of emotion (EMS) predicted any of the dependent variables, 3) whether results remained the same when controlling for individual differences measured in Part 1, and 4) whether those individual differences moderated any of the effects. In addition, I present figures depicting the nonsignificant three-way interaction (theory x instruction x valence).

Discussion

Two major differences distinguished Studies 2 and 3. First, participants rated a range of stimuli, rather than single videos. Although this sacrificed the ability to examine continuous online emotional experience, this design was less likely to produce

idiosyncratic responses to emotion-eliciting stimuli. The second major difference was that Study 3 introduced explicit instructions and a goal within the situation, rather than assessing inferred and unprompted emotion regulation.

The purpose of Study 3 was to investigate the effects of implicit theories of emotion on emotion regulation in a context with a specific goal. In this case, participants were asked to try to remain objective while rating emotionally evocative pictures. I hypothesized that participants in the incremental condition, who read evidence that emotions are malleable, would be more likely to engage in emotion regulation and would rate the pictures as more neutral, compared to participants in the entity condition, who read evidence that emotions are unchangeable. This hypothesis was generally supported: There was a smaller difference in the ratings of positive and negative pictures for those in the incremental condition than those in the entity condition (Figure 11). In other words, incremental participants rated emotionally evocative pictures as more neutral than did entity participants.

Study 1 showed that individual differences in implicit theories of emotion are related to emotion regulation and emotional well-being. In general, incremental theories of emotion are associated with more adaptive forms of emotion regulation, such as cognitive reappraisal, which was the emotion regulation strategy suggested to participants in this study. Both the experimental and trait findings are consistent with the implicit theory model, in which incremental theorists respond to challenges with a mastery pattern of behavior, and entity theorists respond to challenges with a helpless pattern. Studies 4 and 5 test this model more explicitly.

CHAPTER V

STUDY 4: THE EFFECTS OF IMPLICIT THEORIES ON RESPONSES TO EMOTION REGULATION FAILURE

Introduction

The purpose of Study 4 was to examine the effects of implicit theories of emotion on emotional experience and motivation in the face of challenge. In other domains, entity theories predict helpless patterns of response to challenge, in which a person makes maladaptive attributions for their failure (i.e., to uncontrollable factors), experiences more negative affect upon confronting obstacles or failure, avoids further challenge, withdraws effort, and ultimately declines in performance. In contrast, incremental theories predict mastery patterns of response to challenges, in which a person makes adaptive attributions for their failure (i.e., to controllable factors), maintains interest and determination, perseveres through increased effort, and ultimately improves in performance (Blackwell et al., 2007; Diener & Dweck, 1978; Hong et al., 1999; Robins & Pals, 2002). Such patterns of cognition, affect, and motivation can determine whether a person's skills improve or stagnate. If this holds in the domain of emotion, helpless and mastery patterns of emotion regulation may explain why some people are able to regulate their emotions successfully, whereas others fail or do not attempt to do so in the first place.

Helpless- and Mastery-Oriented Patterns

Attributions. In the domain of intelligence, entity theorists are more likely to interpret processes and outcomes in a way that promotes helplessness, whereas incremental theorists are more likely to interpret processes and outcomes in a way that promotes mastery, a pattern found in middle school children (Blackwell et al., 2007) and

in college students (Hong et al., 1999; Robins & Pals, 2002). For example, incremental theorists are more likely than entity theorists to attribute academic failures to lack of effort (Hong et al., 1999), more likely to believe that exerting effort is a normal part of goal striving, and more likely to believe that increasing effort will help them achieve their goals (Blackwell et al., 2007). In contrast, entity theorists are less likely to attribute failure to effort (Hong et al., 1999), and more likely to believe effort indicates low ability (Blackwell et al., 2007). For entity theorists, if you are trying hard, you must not be good at it, a belief that discourages effort and promotes helpless behavior (Hong et al., 1999).

Affect. Upon confronting challenge, entity intelligence theorists are more likely to experience negative affect such as frustration, disappointment, and distress (Blackwell et al., 2007), compared to incremental theorists. This is in part because they believe that effort and failure indicate low global ability, which they believe they cannot improve; this information threatens their self-esteem (Robins & Pals, 2002). In contrast, incremental theorists are less likely to experience negative affect, in part because they believe that effort and failure indicate only low *current* ability, insufficient effort, or ineffective strategies. These attributions do not threaten self-esteem, and so are not likely to produce as much negative affect (see also Dweck, 1999). Dweck reports that some young incremental intelligence theorists have in fact responded to obstacles with positive affect (Dweck & Leggett, 1988), and so might experience greater positive affect in the form of determination, interest, and excitement.

Motivation. Behavioral response to challenge is the central feature of helpless and mastery patterns. When encountering difficulty, entity intelligence theorists are more likely to withdraw from a task and decrease effort, whereas incremental theorists are

more likely to remain engaged and sometimes increase effort (Blackwell et al., 2007; Dweck & Leggett, 1988). A helpless reaction may take the form of losing interest in the task, continuing to use maladaptive strategies (Dweck, 1999), or declining an opportunity for remedial action (Hong et al., 1999). A mastery-oriented reaction could involve maintaining interest, switching to a new strategy (Dweck, 1999), or taking advantage of an opportunity for improvement (Hong et al., 1999).

Mastery and Helplessness in Emotion Regulation

Does the same pattern of cognition, affect, and motivation found in entity and incremental intelligence theorists translate to the domain of emotions? Study 4 was adapted from the paradigm described by Hong et al. (1999), who examined the relationship between implicit theories of intelligence (measured and manipulated), attributions for failure, and coping behavior. Specifically, they gave entity and incremental intelligence theorists a cognitive task and then presented them with standardized low scores. They measured attributions for failure (Studies 1 and 3), and their preferences for remedial action (Studies 2 and 3). In these studies, incremental theorists were more likely to attribute their failures to insufficient effort, compared to entity theorists, and were more likely to choose to try to improve their scores.

In the current study, participants were introduced to an "emotional interference" task, in which emotional stimuli would interfere with their performance on the task. They were then given standardized, negative feedback indicating that their performance was inadequate, after which they rated their attributions for their performance, their negative and positive affect, and their motivation to engage in a tutorial to improve their performance or to engage in an unrelated task. My hypotheses were derived from Dweck

and Leggett's (1988) theoretical description of helpless and mastery patterns, from Hong et al.'s (1999) findings, as well as from the empirical model tested by Robins and Pals (2002), who found that college students with entity and incremental theories of intelligence differed in cognitive, affective, and motivational reactions after encountering academic obstacles.

Attributions. In the emotional domain, people can attribute emotion regulation difficulty to a number of factors. As in the achievement domain, they could attribute emotion regulation failure to a lack of emotion regulation ability, or to insufficient effort. They could also blame emotion regulation difficulty on the strength of the emotional impulses (e.g., "My emotions are just too strong"), or to features of the particular situation (e.g., the strength of the emotion-evoking stimuli, the instructions for a task).

To evaluate cognitive reactions to emotional challenge, I assessed attributions that participants made for their performance—the extent to which they believed their performance was due to ability, effort, strategy, and a variety of other controllable and uncontrollable factors. I predicted that because they believe emotions are changeable, incremental emotion theorists would be more likely to attribute emotion regulation difficulty to controllable factors, such as effort and strategy choice. In contrast, I predicted that because they believe emotions are unchangeable, participants in the entity condition would be more likely to attribute emotion regulation difficulty to uncontrollable factors, such as the strength of the emotional impulse. It is also possible that participants in the entity condition would be more likely to "explain away" their failures, indicating their interest in the task or their current mood as reasons for their difficulty (e.g., Dweck, 1999).

Affect. In the domain of emotion, strong emotions and difficulty regulating emotion threaten well-being for entity theorists, but not necessarily for incremental theorists. Harmon-Jones and colleagues (2011) found that the more people wanted to avoid withdrawal emotions (disgust and fear), the more intensely they experienced them. I have found that an entity theory of emotion is associated with greater avoidance of emotion overall (Study 1), which may be associated with greater reactivity to particularly stressing negative situations. To assess affective reactions to emotional challenge, I measured participants' affect in response to this failure. I hypothesized that those in the entity condition would report feeling more negative affect after receiving failure feedback, compared to those in the incremental condition. It is also possible that those in the incremental condition would report feeling more positive affect, in the form of interest and determination, compared to entity participants (Dweck & Leggett, 1988).

Motivation. To assess motivation following emotion regulation failure, I measured participants' preference for remedial action (adapted from Hong et al. 1999). Participants were given the choice between taking a tutorial that would give them feedback about their performance and techniques on the emotional interference task, or completing an equivalent but unrelated, unemotional task (a reading comprehension tutorial), allowing them to withdraw from the emotional situation. I hypothesized that participants in the incremental condition would be more likely to choose the remedial course of action (emotion regulation tutorial), compared to those in the entity condition, who would be more likely to choose the unrelated reading comprehension tutorial.

Method

Participants

Participants were 92 undergraduate students (67 female, 25 male; 81.5% Caucasian, 2.2% Black/African-American, 12.0% Asian/Asian-American, 12.0% 7.6% other) from the University of Oregon human subject pool who participated in this study in exchange for credit toward an introductory psychology or linguistics class. The average age was 19.41 (*SD* = 1.21, range 18 to 22). Participants signed up for the study online, knowing only that it was a two-part study (15 minutes online, 45 in the laboratory). Before coming into the lab, participants completed the same individual difference measures as in Studies 2 and 3. On average, there were 2.95 days between sessions (range: 0 to 13).

Procedure

Participants were run up to four at a time. Upon reporting to the laboratory, participants read and signed a consent form, and were seated at one of four computers, which were spaced so that no participant could see what was on the other screens. They were told that the laboratory portion of the study consisted of three parts. In the first part, they would read and evaluate an article that presented research conducted at the University of Oregon. Then, they would engage in an unrelated attention control task, which helped us establish stimuli for future research, after which they would complete a recall test about the article they had read.

Assignment to Condition. Participants were randomly assigned to either an entity (*n* = 48) or incremental (*n* = 44) condition. Manipulation of implicit theories of emotion, and reading and manipulation checks were the same as in Studies 2 and 3.

Dot-Probe Task. After completing the manipulation check, participants were told that they would be engaging in an unrelated task, designed to measure "emotional interference." This task was a dot-probe task (also known as an attention probe task), in which two pictures (either two emotionally neutral images, or one emotional image and one emotionally neutral image) appear on screen. Images were chosen from the International Affective Picture System (IAPS; Lang et al., 1995), selected on the same basis as in Study 3. Participants were told,

> This task measures emotional interference- the degree to which emotions interfere with your performance. Some of the pictures will have emotional content that will automatically capture your attention. You will need to ignore the emotional content and focus on identifying the location of the dot. The better able to control your emotions, the better you will do on this task.

In each trial, a fixation cross was presented for 500 ms, followed by a stimulus pair displayed for 1000 ms, followed immediately by the presentation of a dot probe behind one of the two pictures for 100 ms. These presentation times were in part based on past research using this paradigm, and in part on pre-testing, which indicated that a longer presentation of the dot probe did not present enough of a perceived challenge for participants. Participants were instructed to press "k" when the dot appeared on the right, and "d" when the dot appeared on the left. Colored stickers were placed on the keys for reminders. The screen remained blank until the participant pressed the correct key, after which the next trial began. If a participant pressed the wrong key, an "X" would appear and they would need to press the other key. The computer recorded reaction times for each trial and the number of errors participants made.

Participants saw one hundred thirty-five pairs of pictures, presented one pair at a time on a horizontal axis on the computer screen using Direct RT software (Jarvis, 2008).

Images were presented in a block design, with 15 picture pairs per block. Nine blocks were presented, alternating neutral/neutral, neutral/negative, and neutral/positive pairs of images. For all blocks, placement of the dot was such that it appeared equally as often on the right and on the left. For blocks containing emotional stimuli, the dot appeared equally as often behind the emotional stimulus (congruent trials) and behind the neutral stimulus (incongruent trials), and the placement of neutral and emotional stimuli were randomly assigned.

Failure Feedback. When participants finished the dot probe task, the computer prompted them to raise their hands. As they finished, the researcher led them individually into a second room, where a second experimenter waited with a handout that provided them with performance feedback (Appendix G). All participants received feedback that they had done relatively poorly: "You scored in the 27th percentile of all the people who have completed this task, which means that your emotional interference score is relatively high." The complete feedback script is available in Appendix H.

Participants then completed a final series of tasks, in which they rated their attributions for their performance, their current affect, and indicated how much they were interested in one of two tasks: one designed to measure engagement and perseverance with the current task, and one designed to measure withdrawal. Finally, they completed a recall test of the article that they read in the first part of the study, as described in Studies 2 and 3.

Attributions. On the computer, participants were instructed to "rate the extent to which each of the following factors influenced your performance" on a scale from 1 (very slightly or not at all) to 5 (very much). Attributions included "my ability," "my effort,"

"my mood," "my interest in the task," "my concentration," "the strategy I used," "my familiarity or unfamiliarity with the task," "the difficulty of the task," "luck," and "my understanding of the instructions."

Affect. Participants were instructed to "indicate to what extent you feel this way right now" on a scale ranging from 1 (very slightly or not at all) to 5 (extremely) on the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Positive affect words included interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active. Negative affect words included distressed, upset, guilty, scared, hostile, bored, irritable, ashamed, nervous, jittery, afraid, and disappointed.

Motivation. Participants were then told, "In the time remaining, you can choose between the following activities that will help us develop materials for future research. Please tell us how interested you are in each of the tasks, and then choose one." Participants rated how interested they were in one tutorial that had been shown to improve performance on the emotional interference task they had just completed, and how interested they were in another tutorial that had been shown to improve performance on reading comprehension, on a scale from 1 (not at all) to 5 (extremely). They were then asked to choose only one of the tutorials to complete.

Debriefing. Participants did not complete the tutorial, but were instead debriefed as in Studies 2 and 3. In addition, they were told that the feedback that they received regarding their performance on the emotional interference task did not reflect their actual performance, but was identical for each participant.

Results

Manipulation Checks

There were no significant differences in how interesting or informative participants in the entity condition found the article, compared to those in the incremental condition (see Table 21). There was also no difference in participants' moods: entity participants (M = 93.75, SD = 27.72) and incremental participants (M = 94.89, SD = 33.05) were both, on average, in a pleasant mood after reading the article, $t(90) = .15$, $p = .88$, $d = .04$. Participants in the entity condition had a significantly lower implicit theory score (M = 48.36, SD = 24.04) than those in the incremental condition (M = 80.38, SD = 12.00), indicating that the manipulation of implicit theories was successful, $t(86) = 7.85$, $p < .001$, $d = 1.69$. In this sample, participants in the entity condition rated the article as less persuasive (M = 62.50, SD = 20.24) than participants in the incremental condition (M = 72.62, SD = 23.30), $t(86) = 2.18$, $p = .03$, $d = .40$[6].

Table 21. Manipulation check results in Study 4

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Interesting	74.46 (21.40)	80.36 (20.31)	1.32	.19	.28
Informative	79.35 (15.19)	82.14 (22.28)	.69	.49	.14
Persuasive	62.50 (20.24)	72.62 (23.30)	2.18	.03	.40
Mood	93.75 (27.72)	94.89 (33.05)	.15	.88	.04
Implicit Theory	48.36 (24.04)	80.38 (12.00)	7.85	< .001	1.69
N	48	44			

[6] Entering persuasiveness as a covariate did not change the significance levels of the findings reported below. Analyses controlling for persuasiveness in Appendix I.

Hypothesis Testing

All continuous rating scores (except reaction times) were transformed so that they ranged from a possible 0 to a possible 100 scale. Means and standard deviations for each of the groups are presented in Table 22.

Table 22. Descriptive and inferential statistics for dependent variables (Study 4)

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Attributions					
Ability	30.73 (27.89)	44.19 (27.73)	2.30*	.02	.48
Effort	32.29 (29.15)	43.60 (30.42)	1.81†	.07	.38
Mood	38.07 (28.27)	38.02 (30.94)	.01	.99	.00
Interest	41.15 (26.03)	45.93 (25.55)	.88	.38	.18
Concentration	53.13 (29.90)	62.21 (28.02)	1.49	.14	.31
Strategy	33.85 (31.15)	47.67 (30.28)	2.14*	.04	.46
Familiarity	28.65 (27.28)	38.37 (31.50)	1.58	.12	.32
Task difficulty	21.86 (25.59)	22.67 (27.06)	.15	.88	.03
Luck	8.85 (14.11)	8.14 (17.86)	-.21	.83	-.03
Instructions	29.17 (26.96)	30.23 (35.17)	.16	.87	.03
Affect					
Positive	25.83 (15.91)	30.40 (18.46)	1.27	.21	.27
Negative	9.69 (7.80)	9.59 (8.71)	-.06	.96	-.01
Motivation					
Interest in emotion tutorial	44.79 (24.17)	50.00 (28.53)	.95	.35	.20
Interest in other task	29.69 (26.12)	47.09 (29.48)	2.99*	<.01	.62
Preference for emotion over unrelated task	15.10 (29.51)	2.33 (33.99)	-1.92†	.06	-.40
N	48	44			

Note. Standard deviations are presented in parentheses.
† $p < .08$. * $p < .05$.

Attributions. The first hypothesis predicted that participants in the incremental condition would attribute failure to more controllable factors (i.e., effort, familiarity, strategy, and concentration), compared to those in the entity condition, who would

attribute failure to more uncontrollable factors (i.e., mood, luck, misunderstanding the directions, or task difficulty).

Participants in the incremental condition were marginally more likely to attribute their failure to lack of effort (M = 43.60, SD = 30.42) than those in the entity condition (M = 32.29, SD = 29.15), $t(89) = 1.81$, $p = .07$, $d = .38$. Participants in the incremental condition were more likely to attribute their failure to the strategy that they used (M = 47.67, SD = 30.28) compared to those in the entity condition (M = 33.85, SD = 31.15), $t(89) = 2.14$, $p = .04$, $d = .46$. These findings are consistent with the hypothesis. Participants in the incremental condition were also more likely to attribute their failure to low ability (M = 44.19, SD = 27.73) than participants in the entity condition (M = 30.73, SD = 27.89), $t(89) = 2.30$, $p = .02$, $d = .48$. In contrast, participants in entity and incremental conditions were about as likely to attribute their performance to mood, task difficulty, and luck.

Affect. The second hypothesis predicted that participants in the incremental condition would experience less negative affect upon receiving failure feedback, compared to those in the entity condition. Participants in the incremental condition (M = 9.59, SD = 8.71) and those in the entity condition (M = 9.69, SD = 7.80) experienced similar levels of negative affect, $t(89) = .06$, $p = .96$, $d = .01$. Participants in the incremental condition (M = 30.40, SD = 18.46) also did not differ from participants in the entity condition (M = 25.83, SD = 15.91) in the amount of positive affect they experienced after feedback, $t(90) = -1.27$, $p = .21$, $d = -.27$. There were no significant differences between groups on any affect item (e.g., distressed, bored, determined).

Motivation: Task Choice. The third hypothesis predicted that those in the incremental condition would demonstrate more perseverance, compared to those in the entity condition, who would demonstrate more desire to withdraw. A desire to persevere was measured by interest in taking an emotional control tutorial that had been shown to improve performance on the emotion interference task. There was no difference between participants in the entity (M = 44.79, SD = 24.17) and incremental (M = 50.00, SD = 28.53) conditions, however, $t(89) = .95$, $p = .35$, $d = .20$. A desire to withdraw was measured by interest in a tutorial that has been shown to improve reading comprehension (an unrelated task). Contrary to expectations, participants in the incremental condition (M = 47.09, SD = 29.48) expressed a greater desire to engage in the unrelated task than those in the entity condition (M = 29.69, SD = 26.12), $t(89) = 2.99$, $p < .01$, $d = .62$. Because participants in the incremental condition expressed more interest in both tasks, I calculated preference for the emotion-related task over the unrelated task. This difference was marginally significant, such that participants in the entity condition (M = 15.10, SD = 29.51) expressed greater desire for the emotion task over the reading comprehension task, compared to participants in the incremental condition (M = 2.33, SD = 33.99), $t(89) = -1.92$, $p = .06$, $d = -.40$, which was contrary to predictions.

Of the entity participants, 41 (85%) chose the emotion interference tutorial, and 7 (15%) chose the reading comprehension tutorial. Of the incremental participants, 28 (64%) chose the emotion interference tutorial, and 16 (36%) chose the reading comprehension tutorial. A chi-square test was significant, $\chi^2(1) = 5.81$, $p = .02$, but is in an opposite direction than I hypothesized: Participants in the entity condition showed a greater tendency to choose the emotion-related tutorial over the unrelated task, whereas

those in the incremental condition were more evenly split, though the majority of both groups preferred the unrelated task (see Figure 12).

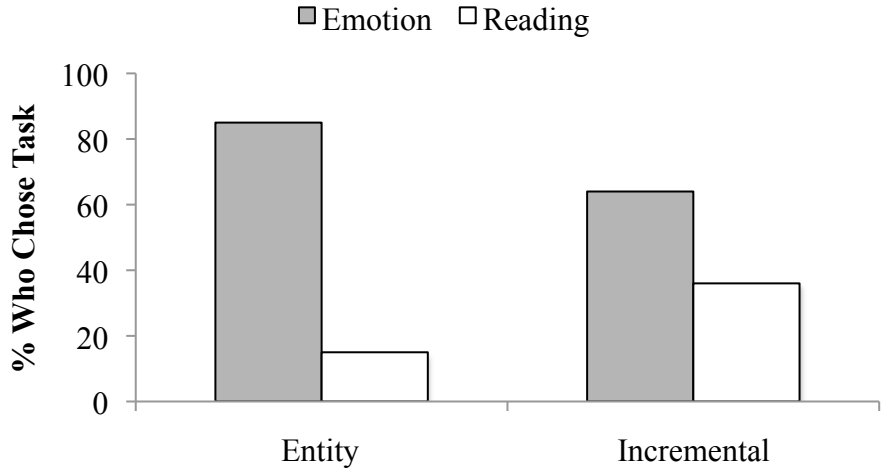


Figure 12. Percent of participants in entity and incremental conditions who chose emotion regulation and reading tutorials.

Relationships Among Attributions, Affect, and Motivation. Regardless of implicit theory condition, do attributions predict affect and motivation to engage or withdraw from the activity? Correlations among attributions, affect, and motivation are reported in Table 23. None of the attributions were associated with negative affect, although positive affect was related to attributions to strategy (r = .29, p = .005), task familiarity (r = .29, p = .005), task difficulty (r = .25, p = .02), and luck (r = .25, p = .02).

Greater interest in the remedial emotion regulation tutorial was related to stronger attributions to mood (r = .23, p = .03), strategy choice (r = .32, p = .002), task familiarity (r = .22, p = .04), and task difficulty (r = .31, p = .003). Greater interest in the unrelated task was related to stronger attributions to effort (r = .23, p = .03). Greater preference for the emotion-related task over the unrelated task was related to stronger attributions to

strategy choice (r = .23, p = .03) and task difficulty (r = .25, p = .02). Interest in the two tasks were correlated at r = .33 (p = .002), and positive and negative affect were correlated at r = .26 (p = .01).

Table 23. Correlations among attributions, affect, and motivation (Study 4)

	Positive Affect	Negative Affect	Interest in emotion task	Interest in unrelated task	Preference for emotion task
Attributions					
Ability	.09	.10	.02	.20	-.16
Effort	.01	.02	.06	.23*	-.14
Mood	.19	.16	.23*	.12	.08
Interest	-.03	.09	.15	.15	-.02
Concentration	-.02	-.08	.13	.08	.05
Strategy	.29*	.07	.32*	.03	.23*
Familiarity	.29*	.13	.22*	-.02	.18
Difficulty	.25*	-.03	.31*	.00	.25*
Luck	.25*	.11	.06	.06	-.01
Instructions	.01	.07	.10	.08	.00
Affect					
Positive	–	.26*	.32*	.26*	.03
Negative		–	.02	.11	-.08
Motivation					
Interest in emotion task			–	.33*	.53*
Interest in unrelated task				–	-.63*

Note. N = 91.
* p < .05.

Follow-Up Analyses

Additional follow-up analyses are presented in Appendix I. I examined 1) whether individual differences in implicit theories of emotion (EMS) predicted any of the dependent variables, 2) whether results remained the same when controlling for individual differences measured in part 1, 3) the reaction times in the dot-probe task, 4)

attribution, controlling for the tendency of incremental participants to make more attributions in general (reflecting a possible response bias), and 5) the results controlling for the perceived persuasiveness of the article.

Discussion

As a whole, Study 4 did not support the hypothesis that an incremental theory would promote a mastery pattern in response to challenge, whereas an entity theory would promote a helpless pattern. There were, however, some notable findings.

Incremental participants were more likely to make attributions for their poor performance overall, and spread out their attributions among several different factors. Compared to those in the entity condition, participants in the incremental condition were more likely to attribute their poor performance to ability and strategy, and marginally more likely to attribute their performance to effort. This latter finding is consistent with research in the academic domain, in which incremental intelligence theorists are more likely to attribute academic failure to insufficient effort (Dweck, 1999). Stronger attribution to strategy by incremental participants is also consistent with the theoretical model, as well as with the results of Study 1, which suggest that incremental participants might be more sensitive to the effectiveness of emotion regulation strategies. Both effort and strategy are controllable factors that allow for improvement in the future. The finding that incremental participants were more likely to attribute their performance to ability was not expected, although this finding can be difficult to interpret because entity and incremental theorists often view ability in different ways: Entity theorists may attribute performance to stable ability, whereas incremental theorists attribute performance to current ability (Dweck, 1999).

The hypothesis that participants in the incremental condition would experience less negative affect after receiving failure feedback, compared to those in the entity condition, was not supported. There was no significant difference in the amount of negative affect reported, and in fact, there were low levels of negative affect reported overall: 70% of participants scored 10 or lower on a 100-point scale. There was also no significant difference between entity and incremental participants in the amount of positive affect that they reported, nor on any single affect items, including interest and boredom, which could be seen as indicators of motivation.

The hypothesis that participants in the incremental condition would show more interest in, and choose to engage in, an emotion regulation tutorial directly related to the task that they had just performed poorly on, was not supported. Interest in the emotion regulation tutorial was designed to indicate perseverance at emotion regulation, whereas interest in the alternative task (a reading comprehension tutorial) was designed to indicate withdrawal or avoidance of further failure. There was no difference between groups in interest in the emotion regulation tutorial, and incremental participants actually preferred the unrelated task, compared to entity participants. When a difference score was computed, entity participants were more likely to prefer the emotion regulation tutorial over the unrelated task, compared to incremental participants, who showed only a slight preference for emotion regulation tutorial over the unrelated task. When forced to choose between the two tasks, most participants, regardless of implicit theory condition, chose the emotion regulation tutorial, and this trend was more pronounced in the entity condition. The finding that incremental participants expressed more interest in both tasks could indicate that they were more engaged in the laboratory session altogether,

compared to entity participants, but this finding was not anticipated and is ambiguous.

Although most participants appeared to believe the feedback, it could be that the participants in this study were not actively engaged in the task, and this could be in part because of their beliefs about emotion and emotion regulation. For example, entity participants, who believe emotions cannot be changed, may not have expected to do well on the task in the first place. Incremental participants, who believe emotions can be changed, may not have seen this task as relevant to real-life situations. This would explain the overall low levels of negative affect experienced even after poor performance feedback, although this idea was not tested directly. Therefore, in Study 5, I made it clearer to participants that the dot-probe "emotional interference" task was associated with real life outcomes.

Thus, on the whole, I did not find support that entity emotion participants exhibited a helpless pattern in response to emotion regulation failure. The design of the current study was adapted from research in other domains of implicit theories. It is possible that implicit theories of emotion do not foster mastery or helpless responses to challenge in the same way that implicit theories of intelligence do. Because it is difficult to interpret null effects, I postpone theoretical interpretation of these findings until the discussion of Study 5, which presents opportunity for replication and extension, with some methodological improvements.

CHAPTER VI

STUDY 5: THE EFFECTS OF IMPLICIT THEORIES OF EMOTION ON EMOTION REGULATION FAILURE AND SUCCESS

Introduction

Like Study 4, Study 5 investigated how implicit theories of emotion influence response to challenge. There were two major differences between Studies 4 and 5, however, as well as more minor methodological improvements.

Major Differences

First, in Study 5, I included both failure and success feedback conditions (randomly assigned). Because challenge is expected to moderate the effect of implicit theories on response patterns, we would expect implicit theories to have a greater effect on cognition, emotion, and motivation in the challenge (failure) condition, and a weaker effect in a non-challenge (success) condition. Therefore, in Study 5, half of the participants were given the same failure feedback as in Study 4, and half were given feedback that their performance was above average.

Second, rather than having a choice between a skill-improving tutorial and an unrelated task, participants completed a second round of dot-probe trials after feedback. Because I did not actually provide a course of remedial action in Study 4, I could only assess intention to take remedial action, but not actual improvement in effort. In Study 5, rather than give participants a choice between a tutorial or unrelated task, I informed them that they would be completing the task a second time, to give them a chance to improve their effort (or, in contrast, to withdraw effort) or to change their strategy.

Methodological Improvements

Although most participants believed the feedback that they received in Study 4 (each person received feedback individually), in Study 5, I made two changes to the procedure to improve realism and strengthen the manipulation. First, when introducing the task, we emphasized the importance of the "emotional interference" (dot probe) task as relevant for everyday life. In Study 4, one reason for the weak results could be because participants, regardless of theory condition, did not see the task as relevant or important to their daily lives. Despite failure feedback, there was a low level of negative affect, indicating that the participants did not perceive the results of the task as relevant to their goals. In Study 5, we included information in the verbal instructions given to participants that indicated that this task predicted success in a number of domains, including relationships and career performance.

Second, to increase the strength and relevance of the feedback manipulation, participants completed the study in pairs, in which one participant received failure feedback, and the other success feedback. This introduced an element of social comparison that simulated a competition; participants learned of their skill in relation to others. In addition to strengthening the manipulation, this allowed for comparisons in response variables in both non-challenging (success) and challenging (failure) conditions. Instructions to the participants were also clarified to reduce confusion regarding dot-probe errors: Before feedback, the researcher told participants that errors and computer glitches would not count in their final reaction time scores.

Hypotheses

First, I hypothesized that after failure feedback, those in the incremental condition would make attributions to controllable factors such as strategy and effort, compared to those in the entity condition, who would be more likely to attribute their failure to uncontrollable factors such as mood and ability. I did not predict any differences in attributions after success feedback. Second, I hypothesized that incremental participants would experience more positive affect than entity participants in the failure condition, but both groups would experience positive affect in the success condition. In addition, I hypothesized that entity participants would experience more negative affect than incremental participants in the failure condition, and both groups would experience low amounts of negative affect in the success condition. Third, I hypothesized that in the failure condition, incremental participants should report greater effort than entity participants in the second round of trials, and that they should perceive their second performance as better. In the success condition, I did not expect differences between implicit theories groups.

Method

Participants

Participants were 114 undergraduate students (67 female, 46 male, 1 unreported; 67.5% Caucasian, 1% Black/African-American, 15.8% Asian/Asian-American, 3.5% Hispanic/Latino, 11.4% other) from the University of Oregon Human Subject Pool who participated in this study in exchange for credit toward an introductory psychology or linguistics class. The average age was 19.98 (*SD* = 2.23, range 18 to 49). Participants signed up for the study online, knowing only that it was a two-part study (15 minutes

online, 45 in the laboratory). Before coming into the lab, participants completed the same individual difference measures as in Studies 2-4. On average, there were 2.8 days between sessions (range: 0 to 18).

Procedure

Participants were run in pairs. When only one participant signed up for a session, a confederate played the part of the second participant, and the true participant was randomly assigned to failure or success conditions. Upon reporting to the laboratory, participants read and signed a consent form, and were seated at one of two computers, spaced so that the participants could not see the other's screen. They were told that the laboratory portion of the study consisted of three parts. In the first part, they would read and evaluate an article that presented research conducted at the University of Oregon. They would then engage in an attentional control task, and finally complete a recall test about the article they had read.

Assignment to Condition. Participants were randomly assigned to either an entity (n = 47) or incremental (n = 67) condition[7]. Manipulation of implicit theories of emotion, and reading and manipulation checks, were the same as in Studies 2-4.

Dot-Probe Task. The dot-probe task was the same as in Study 4, except that three blocks (one of each valence) occurred before feedback, and six blocks (two of each valence) occurred after feedback. In addition, a statement regarding the relevance of this task for real life was added to the instructions: "People who do well on this task (who

[7] Differences in group size were due to random assignment.

have low emotional interference) tend to have better control of their emotions in general, have more stable social relationships, and perform better in job-related tasks."

Success and Failure Feedback. After both participants had completed the dot probe task, the researcher told them that he/she was going to get their scores. The researcher went into another room and came back with a piece of paper that showed supposed results of their performances (see Appendix J). To the person who was assigned to the success feedback condition, the researcher said, "You scored in the 81st percentile of all people who completed this task, which means that your emotional interference score is lower than most people's." To the person who was assigned to the failure feedback condition, the researcher said, "You scored in the 27th percentile of all the people who have completed this task, which means that your emotional interference score is higher than most people's." The full feedback script is presented in Appendix K.

Attributions and Affect. Measures of attributions and positive and negative affect were the same as in Study 4.

Second Dot-Probe Task and Motivation. Participants then completed a second round of dot-probe trials, alternating blocks of neutral-neutral stimuli, negative-neutral stimuli, and positive-neutral stimuli. After they completed the second round, they indicated how well they thought they had performed on the second task, and how much effort they had put into the second task, as a measure of perseverance vs. withdrawal. They were explicitly asked to compare their effort and performance to the first round of trials. The performance question asked, "How do you think you scored, compared to the first trial of this task?" with possible answer choices including "a lot worse than before," "moderately worse than before," "a little worse than before," "about the same as before,"

"a little better than before," etc. The effort question asked, "How much effort did you put in during this trial, compared to last time?" with possible answer choices including "As little as possible," "much less than before," "a little less than before," "about the same as before," "a little more than before," "much more than before," and "as much as possible." Participants then completed the recall task and were debriefed using the procedure described in Study 4.

Results

Manipulation Checks

There were no significant differences in how interesting, informative, or persuasive participants in the entity condition found the article, compared to those in the incremental condition (see Table 24). In this study, however, there was a significant difference in post-manipulation mood: Participants in the entity condition (M = 72.34, SD = 17.47) were in a better mood than participants in the incremental condition (M = 65.17, SD = 18.74), $t(112) = 2.07$, $p = .04$, $d = -.40$. Therefore, all analyses below are reported entering post-manipulation mood as a covariate. Participants in the incremental condition had a significantly higher implicit theory score (M = 74.62, SD = 16.42) than those in the entity condition (M = 43.75, SD = 22.00), indicating that the manipulation of implicit theories was successful, $t(112) = 8.58$, $p < .001$, $d = 1.59$.

Hypothesis Testing

All variables except reaction times were recoded so that they ranged from a possible 0 to a possible 100. Analyses were conducted using 2 (theory: entity vs. incremental) x 2 (feedback: success vs. failure) between-subjects ANOVA, with post-manipulation mood as a covariate.

Table 24. Manipulation check results in Study 5

	Condition				
	Entity	Incremental	*t*	*p*	*d*
Interesting	54.96 (12.49)	52.99 (13.27)	-.80	.42	-.15
Informative	53.90 (13.99)	55.22 (12.72)	.53	.60	.10
Persuasive	46.45 (15.52)	46.77 (14.28)	.11	.91	.02
Mood	72.34 (17.47)	65.17 (18.74)	-2.07	.04	-.40
Implicit Theory	43.75 (22.00)	74.63 (16.42)	8.58	< .001	1.59
N	47	67			

Attributions

The first hypothesis predicted an interaction between theory and feedback: Though there would be no difference in theory conditions in the success feedback condition, in the failure condition, participants in the incremental condition would attribute failure to changeable (vs. unchangeable) factors, compared to those in the entity condition. Mean attribution scores are presented in Table 25.

Table 25. Mean post-feedback attribution ratings for entity and incremental participants

	Condition		
	Entity	Incremental	Total
	Success Feedback		
Ability	43.47 (25.25)	45.59 (29.17)	44.74 (27.44)
Effort	56.52 (22.88)	55.15 (32.44)	55.70 (27.75)
Mood	42.39 (28.64)	41.18 (30.70)	41.67 (29.63)
Interest	72.83 (28.12)	66.91 (28.02)	69.30 (27.96)
Concentration	50.00 (30.15)	48.53 (31.35)	49.12 (30.61)
Strategy	63.24 (29.67)	47.83 (37.63)	57.02 (33.66)
Familiarity	34.78 (31.75)	25.74 (27.86)	29.39 (29.55)
Difficulty	43.48 (28.42)	41.91 (29.34)	42.54 (28.72)
Luck	13.04 (23.68)	9.56 (21.33)	10.96 (22.17)
Instructions	53.26 (29.49)	54.41 (31.06)	53.95 (30.17)
N	23	34	57

Table 25 (continued). Mean post-feedback attribution ratings for entity and incremental participants

	Condition		
	Entity	Incremental	Total
	Failure Feedback		
Ability	30.21 (24.42)	37.88 (23.49)	34.65 (23.98)
Effort	26.04 (26.04)	31.82 (29.49)	29.39 (28.00)
Mood	31.25 (26.83)	37.12 (31.33)	34.65 (29.41)
Interest	42.71 (32.54)	46.97 (29.82)	45.18 (30.78)
Concentration	41.67 (27.25)	36.37 (29.38)	38.60 (28.37)
Strategy	32.29 (29.00)	38.63 (28.70)	35.96 (28.75)
Familiarity	31.25 (23.60)	33.33 (32.27)	32.46 (28.72)
Difficulty	33.33 (24.08)	23.48 (20.67)	27.63 (22.50)
Luck	4.17 (9.52)	8.33 (18.40)	6.57 (15.33)
Instructions	30.21 (32.12)	28.03 (28.48)	28.95 (29.80)
N	24	33	57
	Total		
Ability	36.70 (25.46)	41.79 (26.61)	39.69 (26.15)
Effort	40.96 (28.75)	43.66 (32.96)	42.54 (31.19)
Mood	36.70 (28.00)	39.18 (30.84)	38.16 (29.60)
Interest	57.45 (33.75)	57.09 (30.40)	57.24 (31.68)
Concentration	45.75 (28.70)	42.54 (30.78)	43.86 (29.85)
Strategy	39.89 (34.05)	51.12 (31.51)	46.49 (32.90)
Familiarity	32.98 (27.64)	29.48 (30.13)	30.92 (29.05)
Difficulty	38.30 (26.50)	32.84 (26.90)	35.09 (26.76)
Luck	8.51 (18.26)	8.96 (19.80)	8.77 (19.10)
Instructions	41.49 (32.67)	31.42 (42.44)	41.45 (32.39)
N	47	67	114

Note. Standard deviations are presented in parentheses.

Hypothesis tests are reported in Table 26. There were no significant interactions between implicit theory and feedback condition for any of the attributions. For several attributions, there was a main effect of feedback condition: Participants in the success feedback condition were more likely to attribute their success to ability, effort, mood, understanding of the instructions, the ease of the task, the strategy they used, and their interest level in the task (but not to luck, concentration, or familiarity with the task). There was a marginal main effect of strategy, such that incremental participants (M =

51.12, *SD* = 31.51) were more likely than entity participants (*M* = 39.89, *SD* = 35.05) to attribute their outcome to strategy use, $F(1,110) = 3.39$, $p = .07$.

Table 26. ANOVA tests for group differences in attribution ratings

	Main Effect: Theory *F*(1,110)	Main Effect: Feedback *F*(1,110)	Theory x Feedback Interaction *F*(1,110)
Ability	.99	4.55*	.32
Effort	.16	24.52*	.43
Mood	.17	1.81	.39
Interest	.02	19.80*	.82
Concentration	.36	3.27†	.12
Strategy	3.39†	11.55*	.59
Familiarity	.39	.13	1.00
Difficulty	1.35	8.47*	.71
Luck	.01	1.92	1.10
Instructions	.01	18.44*	.08

† $p < .08$. * $p < .05$.

Affect. Means and standard deviations are reported in Table 27 and ANOVA tests are reported in Table 28.

Table 27. Mean post-feedback ratings of affect and motivation

	Entity	Incremental	Total
	Success feedback		
Positive Affect	41.85 (22.04)	50.15 (22.38)	46.80 (22.42)
Negative Affect	6.42 (5.84)	7.55 (9.37)	7.10 (8.09)
Effort	53.62 (11.19)	47.55 (15.42)	50.00 (14.09)
Performance	46.38 (13.25)	39.22 (17.83)	42.11 (16.40)
N	23	34	57
	Failure feedback		
Positive Affect	31.67 (18.92)	25.23 (14.04)	27.94 (16.43)
Negative Affect	16.47 (11.71)	17.08 (15.51)	16.83 (13.92)
Effort	66.67 (14.74)	64.14 (13.90)	65.20 (14.18)
Performance	53.47 (15.53)	51.01 (18.13)	52.04 (16.98)
N	24	33	57

Table 27 (continued). Mean post-feedback ratings of affect and motivation

	Entity	Incremental	Total
	Total		
Positive Affect	36.65 (20.92)	37.87 (22.44)	37.37 (21.74)
Negative Affect	11.58 (10.52)	12.25 (13.55)	11.96 (12.35)
Effort	60.28 (14.56)	55.72 (17.81)	57.60 (16.01)
Performance	50.00 (14.74)	45.02 (18.81)	47.08 (17.35)
N	47	67	114

Note. Standard deviations are presented in parentheses.

Negative Affect. I hypothesized that entity participants would experience greater negative affect following failure, compared to incremental participants, whereas there would be no difference between implicit theory groups following success. For negative affect, there was no main effect of implicit theory manipulation: Collapsing across feedback conditions, incremental participants (M = 12.25, SD = 13.55) and entity participants (M = 11.58, SD = 10.52) reported no differences in negative affect, $F(1,109) = .09$, $p = .77$. There was a main effect of feedback condition: Collapsing across implicit theories of emotion, participants in the failure feedback condition (M = 16.83, SD = 13.92) reported more negative affect than those in the success feedback condition, (M = 7.10, SD = 8.09), $F(1,109) = 19.04$, $p < .001$. There was no interaction between implicit theory and feedback condition, $F(1,109) = .03$, $p = .87$.

Positive Affect. I hypothesized that incremental participants would experience greater positive affect following failure, compared to entity participants, but that there would be no difference in positive affect between the groups following success. For positive affect, there was no main effect of implicit theory manipulation: Collapsing across feedback conditions, incremental participants (M = 37.87, SD = 22.44) and entity participants (M = 36.65, SD = 20.92) reported no differences in positive affect, $F(1,109)$

= .56, p = .46. There was a main effect of feedback condition: Collapsing across implicit theories of emotion, participants in the success feedback condition (M = 46.80, SD = 22.42) reported more positive affect than those in the failure feedback condition, (M = 27.94, SD = 16.43), $F(1,109) = 19.99$, $p < .001$. There was also a marginally significant interaction between theory and feedback, $F(1,109) = 3.27$, p = .07 (see Figure 13). Specifically, there was a larger difference in positive affect for incremental participants between failure feedback (M = 25.23, SD = 14.04) and success feedback (M = 50.15, SD = 22.38), $t(65) = -5.44$, p = .001, d = -1.33, compared to those in the entity condition (M_{fail} = 31.67, SD = 18.92; M_{succ} = 41.85, SD = 22.04), $t(45) = -1.70$, p = .10, d = -.50.

Table 28. ANOVA tests for group differences in affect and motivation

	Main Effect: Theory	Main Effect: Feedback	Theory x Feedback Interaction
Affect			
Positive	.06	22.41*	3.95*
Negative	.16	20.08*	.02
Motivation			
Effort	2.58	30.62*	.44
Performance	2.31	8.91*	.55

* $p < .05$.

Comparison with Study 4

By examining only the main effect of theory within the failure condition, I could see whether findings from Studies 4 replicated in Study 5. To compare effect sizes, I transformed the results from Study 5 into t-scores and calculated Cohen's d effect sizes for each mean difference (see Table 29). In both studies, incremental participants were more likely to attribute their performance to ability (d's .48, .36) and to strategy (d's .46, .22).

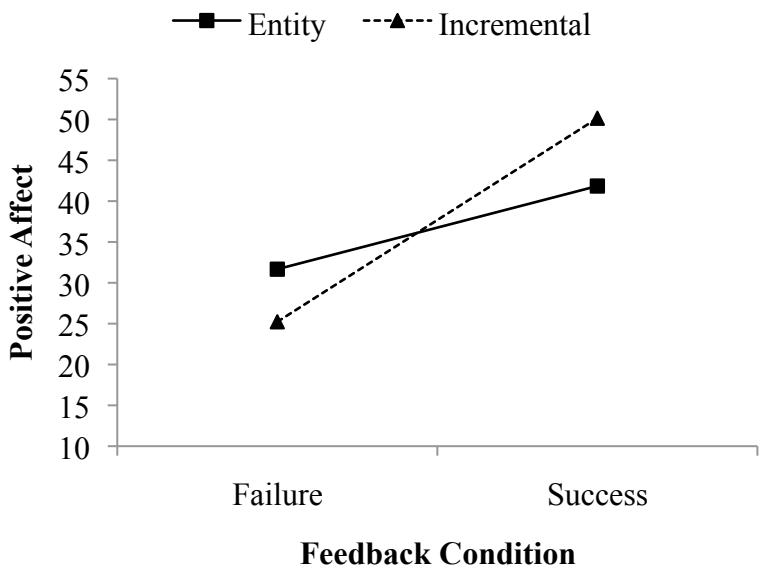


Figure 13. Interaction between theory and feedback condition for positive affect.

Table 29. Comparison of effect sizes in Studies 4 and 5

	Study 4		Study 5	
	t	*d*	*t*	*d*
Attributions				
Ability	2.30	.48	1.20	.36
Effort	1.81	.38	.77	.17
Mood	.01	.00	.74	.20
Interest	.88	.18	.51	.14
Concentration	1.49	.31	-.69	-.18
Strategy	2.14	.46	.82	.22
Familiarity	1.58	.32	.27	.07
Difficulty	.15	.03	-1.66	-.44
Luck	-.21	-.03	1.01	.28
Instructions	.16	.03	-.27	-.07
Affect				
Positive	1.27	.27	-1.48	-.39
Negative	-.06	-.01	.16	.04

Note. A positive score indicates that the incremental mean was higher than the entity mean.

Motivation

Effort. I hypothesized that 1) there would be no difference in theory conditions in the success feedback condition, and 2) in the failure condition, participants in the incremental condition would report greater effort during the second round of trials than those in the entity condition. There was only a main effect of feedback: On average, participants in the success feedback condition reported using the same amount of effort ($M = 4.00$, $SD = .85$), whereas participants in the failure feedback condition reported increasing their effort slightly ($M = 4.91$, $SD = .85$), $F(1,109) = 29.40$, $p < .001$.

Self-Reported Performance. I hypothesized that 1) in the success feedback condition, there would be no difference in theory conditions, and 2) in the failure condition, participants in the incremental condition would believe they improved over time, demonstrating a mastery pattern, whereas those in the entity condition would believe they declined in performance, demonstrating withdrawal from task engagement. There were no significant interactions between implicit theory and feedback condition.

Relationships Among Attributions, Affect, and Motivation

Regardless of implicit theory condition, do attributions predict affect and motivation to engage or withdraw from the activity? Correlations among attributions, affect, and motivation are reported in Table 30. Correlations among attributions, affect, and motivation, broken down by theory condition, are presented in Table 31. Correlations among these variables, broken down by feedback valence condition, are presented in Table 32.

Collapsing across conditions, attributions to ability, effort, mood, interest, concentration, strategy, difficulty, and understanding of instructions were all positively

related to more positive affect (r's .19 to .43, p's < .05). Only attribution to luck was significantly related to negative affect (r = .19, p < .05), though the correlation between negative affect and attribution to mood was marginally significant (r = .18, p = .06). Attribution to familiarity was related to greater effort (r = .26, p = .01) and better self-rated performance (r = .20, p = .04). Positive affect was unrelated to negative affect, effort, or performance, whereas negative affect was related to more effort (r = .31, p = .001) and better self-reported performance (r = .23, p = .01). Effort and performance were moderately correlated (r = .47, p < .001).

Table 30. Correlations among attributions, affect, and motivation (Study 5)

	Positive Affect	Negative Affect	Effort	Performance
Attributions				
Ability	.24*	.02	.07	.01
Effort	.43*	-.09	-.06	-.12
Mood	.30*	.18†	.13	.02
Interest	.22*	-.01	-.10	-.04
Concentration	.41*	-.07	.07	-.04
Strategy	.33*	-.02	-.09	-.15
Familiarity	.01	.13	.26*	.20*
Difficulty	.19*	-.05	-.10	-.09
Luck	.01	.19*	-.04	-.02
Instructions	.40*	-.11	-.07	-.06
Affect				
Positive	–	.01	-.15	-.06
Negative		–	.31*	.23*
Motivation				
Effort			–	.47*
Performance				–

† p < .08. * p < .05.

For both entity and incremental participants, attributions to effort, concentration, and understanding of instructions were associated with greater positive affect. Attributions to mood were significantly related to more positive affect for incremental

participants, and marginally related to more positive affect for entity participants. For incremental participants only, attributions to interest and strategy were correlated with positive affect. Differences in correlations between entity and incremental participants were significant for strategy, $z = 2.05$, $p = .04$, and marginally significant for interest, $z = 1.88$, $p = .06$.

Table 31. Correlations among dependent variables by theory condition

	Entity Condition Only				Incremental Condition Only			
	Pos. Affect	Neg. Affect	Effort	Perf.	Pos. Affect	Neg. Affect	Effort	Perf.
Attributions								
Ability	.17	-.06	.11	.07	.28	.06	.06	-.01
Effort	.29*	-.31*	-.10	-.13	.51*	.01	-.03	-.11
Mood	.27†	-.03	.03	-.15	.31*	.28*	.19	.11
Interest	.02	-.08	-.05	-.07	.37*	.03	-.14	.03
Concentr.	.38*	.02	.30*	-.15	.43*	-.11	-.08	.00
Strategy	.12	-.05	-.01	-.04	.48*	-.01	-.11	-.18
Familiarity	-.16	.04	-.03	-.09	.12	.18	.41*	.33*
Difficulty	.24	.08	-.10	.00	.17	-.12	-.12	-.16
Luck	.01	.09	.04	.10	.02	.24†	-.09	-.08
Instructions	.33*	-.16	.07	-.06	.45*	-.08	-.16	.06
Affect								
Positive	–	-.01	-.01	-.01	–	.02	-.23†	-.08
Negative		–	.29*	.41*		–	.33*	.16
Motivation								
Effort			–	.34*			–	.52*
Performance				–				–

† $p < .08$. * $p < .05$

For entity participants only, attributions to effort were associated with lower negative affect ($r = -.31$, $p = .03$), a relationship that was not significant for incremental participants ($r = .01$, *ns*), $z = 1.69$, $p = .09$. For incremental participants only, attributions to mood were associated with significantly greater negative affect ($r = .28$). For entity participants only, attributions to concentration predicted greater effort during the second

trial (r = 30, p = .04), whereas for incremental participants, attributions to familiarity predicted greater effort during the second trial (r = .41, p = .001) as well as greater self-rated performance (r = .33, p = .006).

In the success feedback condition, attributions to ability, effort, mood, concentration, and instructions were significantly related to positive affect, and attributions to strategy were marginally related. Attributions to mood and luck were associated with greater negative affect, and attributions to task difficult were associated with lower negative affect. In the failure feedback condition, only attributions to concentration were marginally related to more positive affect, and attributions to strategy and difficulty were correlated with greater negative affect.

Table 32. Correlations among dependent variables by feedback condition

	Success Condition Only				Failure Condition Only			
	PA	NA	Effort	Perf.	PA	NA	Effort	Perf.
Attributions								
Ability	.35*	.12	.23†	.07	-.10	.11	.13	.06
Effort	.42*	.01	.09	-.03	.13	.14	.28*	.03
Mood	.41*	.27*	.04	-.21	.10	.25†	.39*	.32*
Interest	.21	.08	.08	.03	-.11	.22	.12	.12
Concentration	.47*	-.09	.17	.03	.24†	.06	.18	-.01
Strategy	.25†	-.07	-.08	-.06	.18	.27*	.26†	-.06
Familiarity	-.05	-.01	.21	.12	.18	.20	.32*	.26†
Difficulty	.02	-.26*	-.07	-.11	.18	.32*	.20	.12
Luck	-.14	.46*	.02	-.09	.15	.14	.01	.15
Instructions	.35*	.08	.05	-.10	.19	.05	.23†	.22
Affect								
Positive	–	.31*	.09	.11	–	.20	.05	.03
Negative		–	-.02	-.02		–	.26*	.22†
Motivation								
Effort			–	.47*			–	.32*
Performance				–				–

† p < .08. * p < .05.

In the success feedback condition, nothing significantly predicted greater effort after the second trial, though attributions to ability were marginally related (r = .23, p = .08). On the other hand, in the failure feedback condition, attributions to effort, mood, and task familiarity significantly predicted more effort, and attributions to strategy and instructions predicted more effort. In the success feedback condition, nothing significantly predicted better self-rated performance, whereas in the failure feedback condition, attributions to mood (r = .32, p = .02) and to task familiarity (r = .26, p = .05) predicted better self-rated performance. Correlations between effort and performance were significant in both conditions.

Follow-Up Analyses

Additional follow-up analyses are presented in Appendix I. I examined 1) whether individual differences in implicit theories of emotion (EMS) predicted any of the dependent variables, 2) the reaction times in the two rounds of the dot-probe task, and 3) the attribution items in more detail, paralleling Study 4.

Discussion

As in Study 4, I had hypothesized that upon encountering failure feedback, participants in the entity condition would display a helpless pattern of maladaptive attributions, greater negative affect and less positive affect, and less persistence in emotion regulation efforts. In contrast, participants in the incremental condition would display a mastery pattern of adaptive attributions, greater positive affect and less negative affect, and greater persistence in emotion regulation efforts. Moreover, I hypothesized that this difference would not be present after receiving success feedback, and that entity

and incremental participants would think, feel, and behave more similarly. These hypotheses, as a whole, were not supported, although some group differences did emerge.

In terms of attributions, it was not surprising that group differences were observed between success and failure feedback conditions. Participants who received success feedback were more likely to attribute their successes to a wide range of factors, including ability, effort, mood, task difficulty, strategy, and interest in the task, compared to those who received failure feedback. In contrast, there was only one marginally significant effect of implicit theory manipulation: Incremental participants were more likely to attribute their outcome to strategy use, compared to entity participants. This effect replicated the finding from Study 4 that incremental participants were more likely than entity participants to attribute failure to strategy use, and consistent with the findings from Study 1, which showed that trait incremental theorists were more likely to use effective emotion regulation strategies compared to ineffective emotion regulation strategies, whereas trait entity theorists did not discriminate to the same degree. The hypothesized interaction between theory and feedback valence did not emerge: Incremental participants were more likely to make strategy attributions regardless of whether they succeeded or failed. One possible explanation is that incremental theorists are more likely to consider strategy in their emotion regulation success or failure, whereas entity theorists are less likely to consider strategy in their attempts to regulate their emotions, although this hypothesis was not directly tested here.

In terms of affect, there was a clear main effect of feedback condition: Participants who received success feedback experienced more positive and less negative affect, compared to those who received failure feedback. There was also a significant

interaction between implicit theory and feedback: Participants in the incremental condition experienced a greater difference in positive affect between failure and success feedback, compared to participants in the entity condition. One possible explanation for this interaction is that participants in the incremental condition were trying out a strategy to regulate their emotions, and those in the success condition were pleased that their strategy worked, whereas those in the failure condition were displeased. Entity participants, on the other hand, may not have expected any strategy to work, so their affective reaction to the feedback was not as strong. Future research should investigate the speculation that incremental theorists are more likely to consider the effectiveness of their strategies before choosing them and are more responsive to feedback about that effectiveness, as this was not directly tested here.

Although Study 5 included several methodological improvements over Study 4, additional improvements could be made. For example, rather than measuring attributions directly ("What factors influenced your performance?" and listing several factors), it may be more useful to provide participants with more direct statements to probe their cognitive patterns following failure or success. As it was, asking participants to rate their attributions for their performance was slightly awkward—in Study 5, participants had to rate the extent to which they felt "the ease or difficulty of the task" contributed to their performance. These double-barreled questions make interpretation of the data difficult. On the other hand, asking participants to rate their agreement with a statement such as "This task was difficult" would be clearer to participants and more interpretable for the researchers.

Together, Studies 4 and 5 suggest that the helpless and mastery patterns that have emerged in the domain of intelligence may not closely parallel helpless and mastery patterns in the domain of emotion. In these two studies, incremental participants were more likely to attribute emotion regulation failure to strategy use, which supports the finding in Study 1 that incremental theorists are more sensitive to the emotion regulation strategies they choose to employ. The entire constellation of cognition, affect, and motivation did not emerge, but these results raise questions that may be addressed in future research.

CHAPTER VII

GENERAL DISCUSSION

Summary of Main Findings

The main purpose of this dissertation was to better understand the construct of implicit theories of emotion and how these beliefs about emotion relate to the regulation and experience of emotion. In Study 1, I developed a questionnaire to assess individual differences in implicit theories, for use in this and future research. I found that an incremental theory of emotion—a belief that emotions are changeable—was associated with greater overall subjective well-being and more positive emotion, and less depression, stress, and negative emotion. This may be due to the emotion regulation strategies that people use: Incremental theorists are more likely to repair negative moods in general, and are more likely to rely on active, flexible strategies such as cognitive reappraisal and active coping. On the other hand, entity theorists are more likely to try to avoid emotions, and to rely on passive, inflexible strategies such as rumination and behavioral disengagement.

Although implicit theories did not have a direct effect on the experience of emotion when participants experienced their emotions naturally (Study 2), participants who had read about the malleability of emotions were more likely to regulate their emotions when the situational goal was clear—that is, when they were asked to try to remain objective while viewing emotion-eliciting stimuli (Study 3). Participants who had read about the automatic and uncontrollable nature of emotions were less likely to regulate their emotions, and rated the images as emotionally evocative while they were supposed to remain objective, as while they attended to the stimuli naturally. In

combination with Study 1, this suggests that implicit theories of emotion influence the experience of emotion by way of emotion regulation.

Studies 4 and 5 examined whether the patterns of helpless and mastery cognition, affect, and motivation found in other domains generalized to emotional challenge. Although the patterns as a whole did not emerge, incremental participants were more likely to attribute their failure (or success) on an emotional control task to the strategy that they used. In addition, in Study 5, incremental participants experienced more positive affect after they succeeded in the emotional control task, and less when they failed, compared to entity theorists. Taken together with the results of Study 1, this suggests that incremental theorists may be more sensitive to the effectiveness of emotion regulation strategies than entity theorists, a hypothesis not directly tested here, but that can and should be examined in future research.

Implications for the Study of Implicit Theories

The research presented here on implicit theories of emotion highlights at least two of the main premises of the implicit theories model (see Dweck, 1999; Dweck & Leggett, 1988). First, past research in other domains of implicit theories suggests that the effects of implicit theories are sensitive to situational context. In non-challenging situations, people who hold entity and incremental theories of intelligence, for example, may perform equally well. When abilities are challenged, however, implicit theories influence how a person thinks, feels, and behaves in response. The experiments presented here demonstrate the importance of situational variables for implicit theories of emotion. For example, implicit theories did not clearly influence the experience of emotion when participants rated their emotional experience without further guidelines (Study 2), but

they did influence emotional experience when participants were explicitly asked to remain objective (Study 3). Although we cannot generalize to other laboratory tasks or to real life, this difference suggests that the role that implicit theories play depends on the context.

Second, past research in other domains of implicit theories has shown that entity theories encourage a helpless response to challenge, and incremental theories encourage a mastery-oriented response to challenge. One of the goals of this dissertation was to investigate the extent to which the implicit theory model generalizes to the domain of emotions. Taken together, the results of Studies 4 and 5 suggest that manipulating implicit theories of emotion does not produce a parallel pattern of cognition, affect, and motivation as does manipulating implicit theories of intelligence, at least in a strict sense. Yet there are indications that implicit theories of emotion are related to helplessness and mastery in emotion regulation in a broader sense.

Study 1 showed that incremental theorists are more likely to distinguish between effective and ineffective emotion regulation strategies, whereas entity theorists are more likely to rely on ineffective ones such as rumination, behavioral disengagement, and denial. These latter strategies represent helplessness, in that they do not involve active problem-solving, and focus instead on the feelings themselves (rumination), distancing oneself from a problem (denial), and giving up (disengagement). In addition, Study 3 showed that entity participants were less likely than incremental participants to respond to instructions to try to remain objective: Their ratings of emotional pictures in the objective condition were similar to their ratings in the attend condition. In other words, they either did not try to remain objective, or they tried, but failed. Finally, in both

Studies 4 and 5, incremental participants were more likely to attribute their performance on an emotional control task to the strategy that they used—an internal, controllable factor. In addition, in Study 5, incremental participants experienced more positive affect when they did well, and less when they did poorly, compared to entity participants, which suggests that they could be more sensitive to performance feedback because it is useful in retaining or revising their strategy, although this was not directly tested here.

Based on these findings, it is likely that helpless and mastery-oriented responses do exist in the domain of emotion, but the patterns of cognition, affect, and behavior that accompany them may be different. In particular, the ideas of failure and success could have different meanings in emotion regulation than in academic achievement. In the case of intelligence, more is clearly better. In the case of emotion regulation, however, the goals may vary between individuals and across situations. Success and failure, therefore, may need to be defined on a situational or personal basis in order for implicit theories of emotion to produce mastery and helpless responses. Specifically, performing well on a computerized laboratory task may not be as important in emotion regulation as the social or emotional consequences of successfully or unsuccessfully regulating one's emotions. We could use vignettes or hypothetical situations with clear goals, memories of personally defined successful or unsuccessful emotion regulation, or a more ecologically valid laboratory task (such as social engagement) with performance feedback to create a sense of failure or success.

Moreover, the attributions, feelings, and motivations that implicit theories of emotion produce may differ from those in other domains. Dweck initially used open-ended questions to probe young students' thoughts and feelings as they encountered

successes and failures. Indeed, much of Dweck's early work was qualitative (see Dweck, 1999, for a review). In this way, she was able to identify variables that distinguished helpless and mastery-oriented individuals. We could investigate the spontaneous attributions people make for emotion regulation success or failure, and the strategies that entity and incremental theorists nominate as likely to be the most useful. Rather than adapting an already existing paradigm to investigate implicit theories of emotion, it might be useful to start from the ground up, both to clarify findings from this research, and to inform future research.

There is one additional parallel between the current studies and previous research on implicit theories in other domains, namely, the tendency for people to endorse incremental over entity beliefs. In Study 1, the mean of the Emotional Mindset Scale was skewed towards the incremental end of the scale, with only a small portion of participants scoring below the midpoint. In Studies 2 through 5, although the manipulation was successful in distinguishing between incremental and entity groups, the manipulation check indicated that the entity groups were, on average, around the mid-point of the scale, rather than below it. Therefore, it could be that participants were simply responding to demand characteristics in answering the manipulation check items. Participants, on average however, rated the articles as persuasive and informative, and several hypothesized effects on dependent variables did emerge.

The bias towards an incremental theory is not unique to implicit theories of emotion. Dweck reports that when incremental items are included in measures of individual differences in implicit theories in other domains, the scale is often skewed (Dweck et al., 1995). Her solution has been to include only items that address entity

beliefs in her measures, explaining that incremental items are especially compelling for participants. Thus, the issue could be a methodological one. Perhaps different items would produce a more balanced scale for the EMS. Perhaps the manipulation used here was not strong enough, and in order to fully create entity theorists, we need to develop a more persuasive manipulation less susceptible to demand characteristics. It will be important to test additional ways to shift implicit theories of emotion, such as through a long-term intervention or personally relevant recollections of emotion controllability or uncontrollability.

On the other hand, this issue could also be a theoretical one: Maybe there just are fewer true entity theorists. Given the single dimension that emerged in the factor analysis in Study 1, as well as this skew towards incremental beliefs in both the individual difference and experimental research, it is likely that the typology of entity and incremental theorists simplifies the nature of implicit theories. Moreover, the terms "entity" and "incremental" were adapted from the implicit theory paradigm, and are not necessarily as meaningful in the domain of emotions as they may be in the domain of intelligence. It may be more useful, therefore, to discuss implicit theories of emotion, as well as implicit theories in other domains, as a spectrum of beliefs about the malleability of the attribute in question, and investigate the relationships those malleability beliefs have for experience and self-regulation in the laboratory and in real life.

Implications for the Study of Emotion Regulation

The idea that some emotion regulation and coping strategies are more effective than others is not new (e.g., Carver et al., 1989; Folkman & Lazarus, 1988; Gross, 1998a; Nolen-Hoeksema, 1991). The current research, however, suggests why some people are

more likely to rely on ineffective strategies. Incremental theorists, because they believe emotions are changeable, are more likely to use adaptive emotion regulation strategies that directly address the problem or influence emotions in a flexible way, such as cognitive reappraisal, active coping, and mood repair in general, which are associated with more positive well-being. In contrast, entity theorists, because they believe emotions are unchangeable, are less likely to use such active strategies, and tend to fall back upon secondary strategies such as avoiding emotions, or ruminating on a negative situation, which are associated with lower well-being.

It is important to note, however, that it is not that entity theorists use maladaptive strategies more than they use adaptive ones. Rather, they use them more than incremental theorists. A belief that emotions are changeable is more likely to foster the development of emotion regulation skills: Incremental intelligence theorists may be more likely to abandon ineffective strategies and try new ones after failure, whereas entity theorists, if they do not give up altogether, may continue to persist with ineffective ones (Dweck, 1999). In emotion regulation, if an incremental theorist does not find that rumination helps, he or she may try something new, such as active coping.

Future Directions

Implicit Theories of Emotion and Emotion-Related Goals

As mentioned above, this research suggests that goals may play an important role in the effect of implicit theories on emotion regulation and experience. Implicit theories of intelligence predict the achievement goals that students adopt: Entity intelligence theorists tend to hold performance goals, in which they seek to demonstrate that they are intelligent (or at least not unintelligent; Elliot & Dweck, 1988), and incremental theorists

tend to hold learning goals, in which they seek to master the skills required of them, taking on new challenges and even risking failure in order to do so (Dweck & Leggett, 1988). Entity personality and moral theorists tend to hold evaluation goals, in which they seek to prove that they possess desirable qualities and document where others stand on a particular trait or moral characteristic, whereas incremental personality and moral theorists tend to hold development goals, in which they seek to develop desired characteristics within themselves, and to understand the processes that lead people to act the way that they do (Chiu et al., 1997; Dweck et al., 1995).

Regarding emotion regulation, one can distinguish performance goals, in which people seek to prove to others that they are able to manage their emotions and are "okay", from learning goals, in which people seek to develop their ability to manage their emotions (Rusk, Tamir, & Rothbaum, 2011). Research suggests that people with performance emotion regulation goals are more likely to use defensive emotion regulation strategies such as rumination and thought suppression, whereas people with learning goals are more likely to use cognitive reappraisal (Rusk et al., 2011). Thus, we can hypothesize that entity emotion theorists tend to hold performance emotion regulation goals, and incremental emotion theorists tend to hold learning emotion regulation goals, but to date, no research has linked implicit theories with emotion regulation goals.

Moreover, having emotion regulation goals in general may be different from having emotion-related goals within a situation. We must therefore distinguish emotion regulation goals (goals relating to one's emotion regulation processes and strategies) from emotion goals (goals related to the experience of emotion, or to the outcomes of

emotion regulation). We sometimes assume that people want to feel pleasure and avoid pain, but because moods and emotions have cognitive and social consequences as well as affective ones, there are cases in which it is more adaptive to down-regulate positive emotions or up-regulate negative ones (Parrott, 1993; Tamir, 2009). For example, anger is perceived as functional within a confrontational context, whereas happiness is perceived as functional within a collaborative context (Tamir & Ford, in press).

The use of emotions to achieve goals, regardless of hedonic tone, is known as instrumental emotion regulation. Not everyone knows which emotions will be useful to them within situations, and more flexible use of emotion regulation within given contexts is related to better overall well-being, compared to inflexible use of emotion regulation (Tamir & Ford, in press). I would hypothesize that an incremental theory is associated with instrumental use of emotion to serve one's contextual goals, and that this mediates positive functioning in social and achievement domains, as well as other aspects of psychological well-being. Because they believe emotions are malleable, incremental theorists may be more able to regulate their emotions flexibly than entity theorists. I chose not to focus on goals in this dissertation, but believe that incorporating the concept of goals in the model of implicit theories of emotion is an important next step.

Individual Differences and Temporal and Developmental Stability

Although four of the five studies presented here experimentally manipulated implicit theories of emotion, it will be important to investigate how trait-level differences in beliefs influence emotion regulation and experience. It is possible that trait implicit theories are more likely to produce consistent patterns of emotion and behavior in a laboratory setting, compared to new belief systems created in the lab. In the experiments

presented here, although I was able to successfully manipulate implicit theories of emotion, it could be that the more stable, familiar beliefs a person holds regarding the nature of emotions are more likely to influence their emotions and emotion regulation.

Another step is to further investigate how stable such beliefs actually are. In Study 1, I found that implicit theories of emotion are moderately stable over a period of weeks, although not as stable as personality traits, and not as stable as implicit theories of personality and intelligence (Dweck et al., 1995). The successful manipulation of implicit theories of emotion in the four experiments presented here provides further evidence that these beliefs can be at least temporarily shifted in an experimental setting. This is important both methodologically, as it provides a way to test causal relationships between implicit theories of emotion and outcome variables such as emotion regulation and experience, but also theoretically. Taken together, these findings suggest that implicit theories themselves are at least somewhat malleable.

One important question is whether these beliefs remain stable over longer periods, such as through major life transitions, over the course of particular forms of psychotherapy (e.g., Cognitive Behavioral Therapy), or over the course of one's lifetime. It is possible that with therapy, or with life experience, people learn that emotions are malleable. Indeed, older individuals tend to experience less negative emotion compared to younger individuals, possibly because they improve in emotion regulation skills over the years (Gross, Carstensen, Pasupathi, Tsai, Skorpen, & Hsu, 1997). Likewise, it will be important to examine how beliefs about emotion develop. It is likely that implicit theories of emotion, like emotions themselves, can be quite dynamic over the lifespan.

Other Emotion-Related Beliefs

In this dissertation, I focused on beliefs about the malleability of emotions. It is possible, however, that there are a number of dimensions of emotion-related beliefs that influence how people experience emotion. For example, in the opening paragraph, I described someone who believed that emotions serve important functions in everyday life, whereas another person believed that emotions interfere with functioning. This helpful versus harmful dimension is one belief system that is worth examining in the future: Does it predict how a person regulates emotions in daily life, and how is it related to implicit theories of (the malleability of) emotion?

Conclusion

In this dissertation, I have demonstrated that there are meaningful individual differences in the ways that people think about emotions, and that these beliefs have implications for the emotions that they feel, the ways that they regulate those emotions, and ultimately, their well-being. Although much more research is needed on this topic, these five studies offer initial information regarding how implicit theories of emotion operate, and suggest ways in which they might interact with situational variables in order to promote helplessness and mastery in emotion regulation.

APPENDIX A

EMOTIONAL MINDSET SCALE (EMS)

Instructions: Please rate how much you agree or disagree with the following statements regarding emotions. Although some of the questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

Disagree Strongly	Disagree a little	Neutral	Agree a little	Agree Strongly
1	2	3	4	5

1. A positive emotion is something that happens to you, not something that you make happen.
2. Negative emotions are something that people have control over.
3. Negative emotions just happen to you, and there is nothing you can do about them.
4. **No matter the situation, you can always influence your positive emotions.**
5. ***No matter how hard they try, people can't really change the emotions that they have.***
6. Positive emotions are caused by forces beyond your control.
7. You can control your negative reactions to bad situations.
8. **When you have negative emotions, you cannot do much to change them.**
9. When people feel positive emotions, it's because they made them happen.
10. ***Everyone can learn to control his or her emotions.***
11. **There is not much a person can do to influence when and how they experience positive emotions.**
12. **You can learn to do something about your negative emotions.**
13. **It is usually not possible to change your negative emotions.**
14. People can learn to influence when and how they experience positive emotions.
15. ***If they want to, people can change the emotions that they have.***
16. **Positive emotions come and go, and there is not much you can do about them.**
17. **No matter how strong a person's negative emotions are, they can always find a way to change them.**
18. When a person feels negative emotions, they have to just let them run their course.
19. **I believe that I am in control of my positive emotional experiences.**
20. ***The truth is, people have very little control over their emotions.***
21. There is no use in trying to influence your positive emotions; you have to just let them happen.
22. When you are feeling bad, there are things you can do to influence your emotions.
23. There is no use in trying to avoid negative emotions.
24. Anyone can learn to influence the positive emotions that they feel.

Note. Bold items are included in the 12-item EMS. Italicized items were included in Tamir et al. (2007).

APPENDIX B

DESCRIPTIVE STATISTICS FOR SCALES IN STUDY 1

	N	Mean[a]	SD	Items	α
Personality Traits					
BFI Extraversion	259	58.08	18.16	8	.87
BFI Agreeableness	259	67.77	13.22	9	.78
BFI Conscientiousness	259	60.91	13.49	9	.79
BFI Neuroticism	259	50.89	17.09	8	.84
BFI Openness	259	63.59	12.74	10	.76
BAS Drive	184	56.96	17.36	4	.77
BAS Fun-Seeking	184	67.47	16.91	4	.67
BAS Reward Responsiveness	184	78.68	13.48	7	.71
BIS Inhibition	184	67.16	15.79	7	.76
LOT Optimism	185	59.52	14.41	9	.71
Discriminant Validity					
Implicit Theories of Intelligence	260	60.10	23.94	4	.95
Academic Self-Efficacy	260	76.98	14.77	12	.88
Locus of Control	75	51.39	16.47	12	.35
Emotion Reg. Self-Efficacy	257	55.38	15.87	10	.79
BEQ Impulse Strength	259	62.44	17.73	4	.70
Well-Being					
PANAS Negative Affect	260	34.11	15.43	10	.86
PANAS Positive Affect	260	61.82	14.21	10	.85
Amusement	260	66.01	18.09	2	.56
Anger	260	38.97	16.71	5	.83
Anxiety	260	44.33	20.78	3	.70
Contempt	260	35.67	17.79	2	.62
Disgust	260	25.78	21.93	1	--
Embarrassment	260	32.34	23.17	1	--
Fear	260	33.03	21.07	2	.83
Guilt	260	32.36	23.95	2	.67
Hope	260	65.67	19.08	2	.75
Interest	260	63.08	15.64	2	.75
Joy	260	66.88	19.01	2	.78
Loneliness	260	36.44	24.32	2	.84
Love	260	68.89	21.11	2	.71
Pride	260	59.81	20.19	2	.72
Sadness	260	30.48	21.09	3	.83
Shame	260	29.90	23.38	1	--
Stress	260	55.82	23.54	2	.83
BEQ Positive Expressivity	260	75.93	14.88	3	.71

	N	Mean[a]	SD	Items	α
BEQ Negative Expressivity	259	49.31	16.13	5	.59
CESD Depression	259	27.22	17.24	20	.91
PSS Perceived Stress	259	43.96	17.99	4	.76
BAI Anxiety	75	76.30	17.40	21	.92
PWB Autonomy	185	51.25	16.44	3	.63
PWB Environmental Mastery	185	53.26	13.62	3	.59
PWB Personal Growth	185	64.73	13.68	3	.54
PWB Positive Relationships	185	50.78	15.73	3	.66
PWB Purpose in Life	185	50.84	15.35	3	.50
PWB Self-Acceptance	185	58.71	16.46	3	.70
RSE Self-Esteem	184	69.88	19.98	10	.90
SWLS Satisfaction with Life	258	62.53	19.88	5	.87
Emotion Regulation					
ERQ Reappraisal	260	63.71	14.45	6	.79
ERQ Suppression	260	36.22	16.25	4	.69
TMMS Repair	259	63.43	16.75	6	.80
TMMS Attention	259	67.26	12.17	13	.84
TMMS Clarity	259	58.41	13.68	11	.84
NFA Approach	260	61.83	12.79	13	.83
NFA Avoid	260	39.06	15.18	13	.86
RRQ Rumination	260	62.23	15.91	12	.87
COPE Active Coping	185	67.48	20.51	2	.68
COPE Planning	185	70.99	21.27	2	.71
COPE Positive Reframing	185	60.63	23.59	2	.69
COPE Acceptance	185	64.41	21.76	2	.45
COPE Humor	185	55.14	29.63	2	.81
COPE Religion	185	28.83	30.85	2	.86
COPE Emotional Support	185	61.80	27.04	2	.79
COPE Instrumental Support	185	64.96	25.63	2	.87
COPE Self-Distraction	185	83.60	23.04	2	.63
COPE Denial	185	14.77	22.54	2	.77
COPE Venting	185	42.52	22.45	2	.42
COPE Substance Use	185	17.03	25.00	2	.91
COPE Behavioral Disengagement	185	20.00	20.84	2	.62
COPE Self-Blame	185	41.71	28.93	2	.81

Note. BFI = Big Five Inventory; BAS = Behavioral Activation System; BIS = Behavioral Inhibition System; LOT = Life Orientation Test; BEQ = Berkeley Expressivity Questionnaire; PANAS = Positive and Negative Affect Schedule; CESD = Center for Epidemiology Scale—Depression; BAI = Beck Anxiety Inventory; PWB = Psychological Well-Being; RSE = Rosenberg Self-Esteem; SWLS = Satisfaction with Life Scale; ERQ = Emotion Regulation Questionnaire; TMMS = Trait Meta-Mood Scale; NFA = Need for Affect; RRQ = Reflection and Rumination Questionnaire; COPE = Brief COPE.

[a] All measures were rescaled so that they ranged from a possible 0 to 100.

APPENDIX C

EXPERIMENTAL STIMULUS: ENTITY CONDITION

(next page)

APA Science Observer

-- an American Psychological Association Publication

Emotions are fixed, automatic processes

By Laurie James

Washington

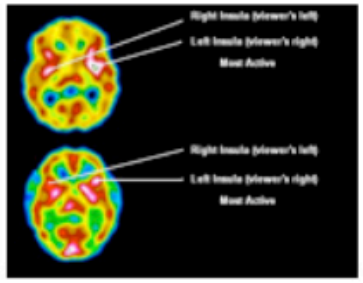
Bradley M* has always had strong emotions. When he is happy, he is exuberant, greeting friends and strangers alike with a wide grin. When he is upset with someone, he bursts out in anger. When he is sad, he cannot shake the blues, and sometimes cries uncontrollably.

When his emotions began to interfere with his marriage and work life, though, Bradley sought answers as to why his emotions were so strong, and what he could do to control them. It turns out that recent psychological research suggests that emotions are more fixed and automatic than we might think. Factors like genes, personality, and brain activity influence how we feel about emotions more than our best day-to-day attempts at regulating them.

Emotion in the Brain

Researchers in the Emotion Research Lab (ERL) at the University of Oregon are interested in how emotions arise and unfold over time. To investigate this question, they used functional magnetic resonance imaging (fMRI), a technique that measures brain activity as people engage in ongoing tasks.

ERL researchers have found that emotions mostly occur in evolutionary older parts of the brain such as the amygdala and the insula (see Figure 1). We share these parts of the brain with our more primitive ancestors, who tend to respond quickly and automatically to their emotions without any thought or attempt at control.



According to Emily Zelinski, lead researcher in the ERL, this suggests that emotions are remnants of human evolution that developed to deal with immediate problems and opportunities in the environment. "The reason we cannot control our emotions," Zelinski says, "Is because emotions evolved to control us." If we need a quick reaction, emotions are useful. But they do not always serve our purposes in modern society.

Emotions and Personality

Research on personality development shows a similar pattern. Dr. Daria McMillan, a researcher at the Research on Child Development Center at Harvard has tracked hundreds of children from birth until age 18. She has consistently found that emotionally reactive children demonstrate this same pattern later in childhood and through adolescence. This dimension of reactivity vs. emotional stability is part of a child's *temperament*: the biologically-based personality patterns that remain stable over the lifetime.

"Most people are born either an emotional person

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* To protect his privacy, the real name of the individual involved was changed.

or a calm person," Dr. McMillan says. "Children can learn to control how they express their emotions, but how they feel deep down is part of who they are."

Emotions and Relationships

Research in social and personality psychology has demonstrated that emotions are an important part of personality, and that others perceive our emotions as a stable part of who we are.

"The ability to predict which emotions we will feel and how we will act on them is a key factor in how well we get along with others," says social psychologist Marc Gillotte, who has studied small groups of acquaintances in the lab. His research suggests that those who are better able to predict how others will feel are more successful at group-oriented tasks, and get along better with their peers. "Our friends and family members come to know us by the emotions we feel and express," says Gillotte. "Those who know and understand us best know our emotional patterns. They can predict which emotions we will feel and how we will act on them. This allows us to feel more comfortable around each other." In other words, one of the most important factors in developing and maintaining relationships with others is to understand and be able to predict others' emotions, as well as our own.

Emotions and Therapy

Dr. Frank Rodgers, a cognitive-behavioral therapist in Washington, teaches his clients that the best thing we can do in order to manage our emotions is to understand them. After all, emotions give us important information about our situation: Emotions tell us when things are going wrong (or right).

What we can do is to understand how emotions unfold over time, and learn our own personal patterns. For people like Bradley, who tend to feel very strong, uncontrollable emotions, this means identifying when he is likely to feel certain emotions. He can then predict what will happen in a given situation, and manage his behavior in response to those emotions. "Even though we can't always change how we feel, we can change how we act," says Dr. Rodgers.

This is an important step in learning how to flourish in everyday life—in our work and in our relationships.

To conclude, research findings from a wide range of studies, including brain imaging, longitudinal, and intervention research, converge to one major conclusion: emotions are fixed, automatic processes that are quite difficult to change. What we can do is learn to recognize an important part of our human nature, and manage our behavior in response.

APPENDIX D

EXPERIMENTAL STIMULUS: INCREMENTAL CONDITION

(next page)

APA Science Observer

-- an American Psychological Association Publication

Emotions are dynamic, changeable processes

By Laurie James

Washington

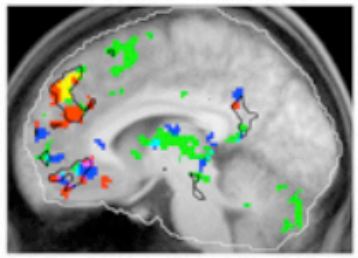
Bradley M* has always had strong emotions. When he was happy, he was exuberant, greeting friends and strangers alike with a wide grin. When he was upset with someone, he would burst out in anger. When he was sad, he could not shake the blues, and sometimes cried uncontrollably.

When his emotions began to interfere with his marriage and work life, though, Bradley sought answers as to why his emotions were so strong, and what he could do to control them. It turns out that recent psychological research suggests that emotions are more dynamic and changeable than we might think. Factors like the activities we engage in, the effort we put into managing our emotions, and personality growth over time influence how we feel about emotions more than our genes.

Emotion in the Brain

Researchers in the Emotion Research Lab (ERL) at the University of Oregon are interested in how emotions arise and unfold over time. To investigate this question, they used functional magnetic resonance imaging (fMRI), a technique that measures brain activity as people engage in ongoing tasks.

ERL researchers have found that early in an emotional reaction, evolutionary older parts of the brain like the amygdala and insula, which we share with our more primitive ancestors, show more activity. But as we continue to experience emotional situations, evolutionarily newer parts of the brain in the prefrontal cortex show activity, too (See Figure 1).



According to Emily Zelinski, lead researcher in the ERL, this suggests that emotions are highly dynamic over time, and even though they may arise quickly and automatically, they can be changed. "We are not just slaves to our emotions like our ancestors were," Zelinski says. "We can draw upon our higher cognitive powers to think about them differently, and change them if they are not serving our purposes."

Emotions and Personality

Research on personality development shows a similar pattern. Dr. Daria McMillan, a researcher at the Research on Child Development Center at Harvard has tracked hundreds of children from birth until age 18. She has consistently found that young children show strong, automatic emotional reactions, but over time, their emotional reactions become less extreme as they gain more control over their environment and the way that they think about emotions. Even those children who seem out of control as toddlers can eventually learn

* To protect his privacy, the real name of the individual involved was changed.

that emotions are changeable and that they don't have to simply let their emotions take over.

"Some people think that you are born an emotional person or a calm person," Dr. McMillan says, "but that doesn't mean that it will be that way for your whole life."

Emotions and Relationships

Research in social and personality psychology has demonstrated that emotional processes, and how we manage them, are important parts of interpersonal relationships.

"The ability to control which emotions we feel and how we act on them is a key factor in how well we get along with others," says social psychologist Marc Gillotte, who has studied small groups of acquaintances in the lab. His research suggests that those who are better able to control their own emotions are more successful at group-oriented tasks, and get along better with their peers. "Our friends and family members come to know us by how well we manage our emotions," says Gillotte. "We need to be able to control how we experience and express our emotions in order to act appropriately in social situations. This allows us to feel more comfortable around each other." In other words, one of the most important factors in developing and maintaining relationships with others is to understand and be able to control our emotions.

Emotions and Therapy

Dr. Frank Rodgers, a cognitive-behavioral therapist in Washington, teaches his clients that the best thing we can do in order to manage our emotions is to know how and when to change them. After all, emotions are fluid—they are constantly changing over time, and we can guide when and how we feel them.

What we can do is to change the way we think about situations and events, and this in turn influences how we feel. For people like Bradley, who tend to feel very strong, uncontrollable emotions, this means putting in effort to change the way he thinks and behaves, in order to change how he feels. "Even though emotions can be overwhelming, we can learn to change how we feel and express them," says Dr. Rodgers.

This is an important step in learning how to flourish in everyday life—in our work and in our relationships.

To conclude, research findings from a wide range of studies, including brain imaging, longitudinal, and intervention research, converge to one major conclusion: emotions are dynamic processes that can be changed. What we can do is to learn how emotions unfold over time, and focus on our thoughts and behaviors that give rise to them.

APPENDIX E

FOLLOW-UP ANALYSES FOR STUDY 2

Peaks and Ends

The peak-and-end rule suggests that the most intense moments of an emotional experience and the ending of emotional experience are psychologically meaningful (for a review, see Fredrickson, 2000). I therefore analyzed whether incremental and entity participants differed at the peaks of each of the videos, and at the end of each of the videos, as measured using the continuous rating dials, grouped into 10-second increments. I defined peaks both nomothetically (by examining the high and low points for each movie clip for the whole sample, and examining whether the groups differed at those particular time points) and idiographically (by extracting the minimum and maximum ratings for each person).

Negative Video

For the negative video, incremental participants (M = -2.43, SD = 1.30) did not significantly differ from entity participants (M = -2.71, SD = 1.14), at the end of the negative video, $t(140) = -1.31$, $p = .19$, although there was a small effect size suggesting that incremental participants ended on a slightly less negative note than entity participants, $d = -.23$. They also did not differ at the lowest point of the sample (segment 15), with incremental (M = -2.92, SD = 1.21) and entity (M = -3.00, SD = .99) participants equally negative, $t(140) = -.40$, $p = .69$, $d = -.08$. When measured idiographically, the incremental group had an average minimum value of -3.14 (SD = 1.04), and the entity group had an average minimum value of -3.12 (SD = .85), which did not significantly differ, $t(140) = .15$, $p = .88$, $d = .02$. Results are reported in Table A1.

Table E1. Peak and end emotional experiences for negative video.

	Entity	Incremental	*t*	*p*	*d*
Negative end	-2.71 (1.14)	-2.43 (1.30)	-1.31	.19	-.23
Negative peak (sample)	-3.00 (.99)	-2.91 (1.21)	-.40	.69	-.08
Negative peak (person)	-3.12 (.85)	-3.14 (1.04)	.15	.88	.02
N	65	77			

Neutral Video

For the neutral recovery video, entity participants (M = 1.85, SD = 1.20) did not differ from incremental participants (M = 1.93, SD = 1.14) in their final ratings of the neutral video, $t(65) = -.27$, $p = .79$, $d = -.07$. They also did not differ in the peak of the neutral video (segment 15), with entity participants (M = 1.92, SD = 2.01) and incremental participants (M = 2.01, SD = 1.19) rating their affect similarly, $t(65) = -.32$, $p = .75$, $d = -.06$. The groups also did not differ in their average maximum affect rating: Entity participants had a maximum of 2.06 (SD = 1.14) and incremental participants had a maximum of 2.31 (SD = 1.16), which did not differ, $t(65) = -.87$, $p = .39$, although there was a small effect indicating that incremental participants experienced a more positive peak than entity participants, Cohen's $d = -.22$. Results are reported in Table A2.

Table E2. Peak and end emotional experiences for neutral recovery.

	Entity	Incremental	*t*	*p*	*d*
Neutral end	1.85 (1.20)	1.93 (1.14)	-.27	.79	-.07
Neutral peak (sample)	1.92 (2.01)	2.01 (1.19)	-.32	.75	-.06
Neutral peak (person)	2.06 (1.14)	2.31 (1.16)	-.87	.39	-.22
N	29	38			

Positive Video

For the positive recovery video, entity participants (M = 2.46, SD = 1.16) ended on a higher note than incremental participants (M = 1.74, SD = 1.74), $t(73) = 2.11$, p = .04, d = .49. They did not significantly differ at the sample's maximum, with entity participants (M = 1.99, SD = 1.61) rating their affect as nonsignificantly higher than incremental participants (M = 1.32, SD = 1.87), $t(73) = 1.65$, p = .10, d = .39. They also did not differ in their idiographically defined peaks: entity participants had an average maximum rating of 2.58 (SD = 1.14), and incremental participants had an average maximum rating of 2.28 (SD = 1.15), $t(73) = 1.15$, p = .25, d = .27. Although the group differences were not consistently significant at $p < .05$, there are small effect sizes for all measures of emotion, suggesting that entity participants may experienced higher positive affect during key points in the positive video. These results are reported in Table A3.

Table E3. Peak and end emotional experiences for positive recovery.

	Entity	Incremental	*t*	*p*	*d*
Positive end	2.46 (1.16)	1.74 (1.74)	2.11	.04	.49
Positive peak (sample)	1.99 (1.61)	1.32 (1.87)	1.65	.10	.39
Positive peak (person)	2.58 (1.14)	2.28 (1.15)	1.15	.25	.27
N	36	39			

Trait Implicit Theories of Emotion

Data on individual differences in implicit theories of emotion were collected before participants reported to the laboratory for the experimental session. The analyses from Study 2 were repeated, substituting the EMS score for manipulated implicit theory. Prior to coming in to the lab, participants assigned to the entity group (M = 62.82, SD = 14.43) did not differ from participants in the incremental group (M = 63.43, SD = 16.34)

on trait implicit theories of emotion, $t(138) = -.24$, $p = .82$. Continuous ratings on the implicit theory of emotion manipulation check (state implicit theory) did, however, correlate with trait ratings of implicit theories of emotion, $r(138) = .39$, $p < .001$. For the following analyses, I first ran simple correlations between trait implicit theory and emotion, and then ran regression analyses, entering in both trait and manipulated implicit theory, predicting emotion.

Emotion During Negative Video

Trait implicit theory was not related to self-reported sadness after the film clip, $r(138) = -.11$, $p = .19$, but it was related to the aggregated mean affect ratings during the negative video, $r(138) = .19$, $p = .03$, such that those with a higher trait incremental theory experienced greater negative affect during the negative video. When both trait and manipulated implicit theories of emotion were entered into a regression equation, trait incremental theory predicted more negative affect during the negative video, $b = .012$ ($SE = .005$), $t(137) = 2.24$, $p = .03$ but manipulated theory did not, $b = .005$ ($SE = .17$), $t(137) = .03$, $p = .98$. These results are reported in Table E4. Neither of the interactions between trait and manipulated implicit theory was significant.

Using multi-level modeling (SPSS 17.0 Mixed Models), I analyzed trait implicit theory predicting affect ratings during the negative video. Trait implicit theory (centered on the grand mean), time, and the interaction between the two were entered as predictors. There was a main effect of trait implicit theory, such that those with a higher incremental theory experienced more positive affect during the video, $b = .006$ (SE = .003), $t(2520) = 1.98$, $p = .047$. The effect of time was significant, and the interaction between EMS and time was as well, $b = .0006$ ($SE = .0003$), $t(2520) = 2.04$, $p < .041$.

Table E4. Trait-level implicit theories predicting experience of negative affect during sad video.

	b	*SE*	*β*	*t*	*p*
	Self-reported sadness during negative video				
EMS	.012	.005	.19	2.24	.03*
Manipulated	.005	.005	.00	.03	.98
	Aggregated mean affect rating during negative video				
EMS	-.010	.008	-.11	-1.33	.19
Manipulated	.218	.236	.08	.92	.36

Emotion During Neutral Video

For the neutral recovery video, trait implicit theory did not predict self-reported happiness, $r(65) = .03$, $p = .83$ or sadness, $r(65) = -.04$, $p = .74$, but it did marginally predict aggregated mean affect ratings, such that those with incremental theories rated their affect during the neutral video as more positive overall, $r(65) = .23$, $p = .06$. When entered with manipulated theories of emotion, trait implicit theories of emotion was marginally related to aggregated affect ratings, $b = .014$ ($SE = .007$), $t = 1.89$, $p = .06$. These results are reported in Table E5, along with results for the positive recovery video.

Emotion During Positive Video

For the positive recovery video, trait implicit theory did not predict self-reported amusement, $r(71) = -.19$, $p = .11$ or self-reported sadness, $r(71) = -.12$, $p = .31$. Nor did it predict the aggregated mean affect ratings during the video, $r(71) = -.05$, $p = .65$. None of the interactions between trait and manipulated implicit theory were significant.

Table E5. Trait-level implicit theories predicting experience of affect during recovery.

	b	*SE*	*β*	*t*	*p*
	Aggregated mean affect rating during neutral recovery video				
EMS	.014	.007	.23	1.89	.06^{+}
Manipulated	.044	.231	.02	.19	.85
	Aggregated mean affect rating during positive recovery video				
EMS	-.004	.009	-.06	-.48	.63
Manipulated	-.218	.258	-.10	-.85	.40

To examine the slope of recovery over time, I used multi-level modeling, with EMS, time, and the interaction between the two as predictors of affect ratings. For the neutral video, there was a main effect of time, and a main effect of trait implicit theories, such that those with incremental theories experienced more positive affect, $b = .01$ (SE = .004), $t(1139) = 2.39$, $p = .02$. The interaction was not significant, $b < .001$, $t(1139) = .89$, $p = .37$. For the positive video, there was significant main effect of time, and a main effect of implicit theories, $b = .014$ ($SE = .005$), $t(1241) = 2.72$, $p = .007$, such that those with an incremental theory experienced more positive affect during the video. The interaction between EMS and time was significant, $b = -.002$ ($SE = .0005$), $t(1241) = -3.98$, $p < .001$, suggesting that those with a trait incremental theory recovered less quickly over the course of the positive video, compared to those with trait entity theories.

Individual Differences as Covariates

The Big Five personality traits, emotional impulse strength, locus of control, cognitive reappraisal, and implicit theories of intelligence (measured in Part 1) were entered into regression equations with manipulated implicit theory predicting aggregated affect. In no cases did the manipulated implicit theory of emotion predict affect ratings,

so they are omitted from the tables, however, coefficients in Tables E6-E8 are controlling for the effect of the manipulation.

Negative Video

Neuroticism, impulse strength, and locus of control all predicted negative affect, but the manipulation was nonsignificant (see Table E6). Specifically, higher neuroticism, stronger emotional impulse strength, and external locus of control each predicted lower affect ratings, controlling for the effect of the implicit theory manipulation.

Table E6. Covariates predicting mean affect ratings during negative video.

	b	*SE*	*β*	*t*	*p*
Baseline mood	.097	.067	.12	1.45	.87
Extraversion	-.006	.005	-.10	-1.21	.23
Neuroticism	-.016	.005	-.30	-3.62	< .001
BEQ impulse	-.011	.004	-.24	-2.84	.005
Locus of control	-.015	.004	-.28	-3.38	.001
Reappraisal	.003	.005	.05	.55	.58
Implicit theories of intelligence	-.003	.004	-.08	-.96	.34

Note. Rows represent separate analyses. Each analysis controlled for manipulated implicit theory of emotion. Manipulated implicit theory was not significant in any case.

Neutral Video

Individual difference variables from Part 1 were entered into regression equations with manipulated implicit theory predicting aggregated mean affect during the neutral recovery video. Baseline mood predicted affect ratings during the neutral video, such that people who started out in a higher mood had higher affect ratings during the recovery video, $b = .19$ (SE) $= .09$, $t = 2.09$, $p = .04$. Higher extraversion marginally predicted higher affect ratings during the neutral video, $b = .01$ ($SE = .007$), $t = 1.69$, $p = 10$. None of the other covariates predicted affect ratings (see Table E7).

Table E7. Covariates predicting mean affect ratings during neutral recovery video.

	b	*SE*	*β*	*t*	*p*
Baseline mood	.187	.089	.25	2.09	.04
Extraversion	.012	.007	.21	1.69	.10
Neuroticism	-.007	.006	-.13	-1.02	.31
BEQ impulse	-.001	.005	-.04	-.30	.77
Locus of control	-.004	.006	-.09	-.74	.46
Reappraisal	.010	.007	.17	1.40	.17
Implicit theories of intelligence	.005	.005	.13	1.00	.32

Note. Rows represent separate analyses. Each analysis controlled for manipulated implicit theory of emotion. Manipulated implicit theory was not significant in any case.

Positive Video

Individual difference variables from Part 1 were entered into regression equations with manipulated implicit theory predicting aggregated affect during the positive recovery video. None of the covariates predicted affect ratings, except that greater use of cognitive reappraisal predicted marginally higher ratings, $b = .014$ ($SE = .008$), $t = 1.79$, $p = .08$ (see Table 2.13).

Table E8. Covariates predicting mean affect ratings during positive recovery video.

	b	*SE*	*β*	*t*	*p*
Baseline mood	.138	.104	.16	1.33	.19
Extraversion	.005	.007	.09	.75	.46
Neuroticism	-.010	.007	-.17	-1.40	.16
BEQ impulse	.008	.007	.13	1.12	.27
Locus of control	-.001	.007	-.01	-.10	.92
Reappraisal	.014	.008	.21	1.79	.08
Implicit theories of intelligence	-.002	.006	-.05	-.52	.68

Note. Rows represent separate analyses. Each analysis controlled for manipulated implicit theory of emotion. Manipulated implicit theory was not significant in any case.

Individual Differences as Moderators

To test for moderation by individual differences, the variables listed above were entered into regression equations along with their interaction term with manipulated implicit theories of emotion. In this case, the continuous ratings of implicit theories of emotion that participants made during the manipulation check was used, and both were centered on the grand mean.

Negative Video

There were significant main effects of neuroticism (β = -.29, p = .001), impulse strength (β = -.23, p = .005), and locus of control (β = -.27, p = .001), and a marginal main effect of trait implicit theories of intelligence (β = .18, p = .06), but the interactions with manipulated implicit theories of emotion were nonsignificant. There were marginally significant interactions between manipulated implicit theories of emotion and conscientiousness (β = .16, p = .06) and implicit theories of intelligence (β = .15, p = .07).

Neutral Video

There were significant main effects of openness (β = .37, p = .009) and conscientiousness (β = .24, p = .047), and marginally significant main effects of baseline mood (β = .22, p = .08) and implicit theories of intelligence (β = .22, p = .09). There was also a significant interaction between implicit theories of emotion (manipulated) and implicit theories of intelligence (β = -.27, p = .03).

Positive Video

There was a significant main effect of agreeableness (β = .28, p = .02) and a marginal main effect of cognitive reappraisal (β = .23, p = .054). There was also a

significant interaction between manipulated implicit theory of emotion and openness (β = .28, p = .02), and a significant interaction between manipulated implicit theory of emotion and locus of control (β = -.32, p = .008).

APPENDIX F

FOLLOW-UP ANALYSES FOR STUDY 3

Correlations Between Attend and Reappraise Ratings.

To further examine the interaction between instruction and implicit theory, I analyzed the correlation between a person's picture ratings in attend and reappraise trials. If entity participants are less responsive to instructions to remain objective, we would expect a larger correlation between ratings in the two instruction conditions, compared to incremental participants. Overall, the correlation between attend and reappraise ratings for incremental participants was $r(44) = .43$, and for entity participants was $r(45) = .60$. This difference was nonsignificant, $z = -1.09$, $p = .28$. Correlations between attend and reappraise ratings also did not differ between entity and incremental groups in the neutral or positive pictures (see Table F1). For the negative pictures, however, entity participants had a significantly higher correlation, $r(45) = .62$ than incremental participants, $r(42) = .18$, $z = -2.52$, $p = .01$. The correlation was significant for entity participants, $p < .001$, but not for incremental participants, $p = .22$.

Table F1. Correlations between attend and reappraise conditions

	Negative	Neutral	Positive	Total
Incremental ($n = 46$)	.18[ns]	.29*	.42**	.43**
Entity ($n = 47$)	.62**	.53**	.48**	.60**
Total ($N = 93$)	.41**	.38**	.45**	.48**
Difference in correlation	$z = -2.52$ ** $p = .01$	$z = -1.36$ $p = .17$	$z = -.35$ $p = .72$	$z = -1.09$ $p = .28$

[ns] nonsignificant. * $p < .05$. ** $p < .01$.

Trait Implicit Theories of Emotion

The hypothesis tests conducted in Study 3 were repeated, substituting the trait level implicit theories of emotion, as measured by the EMS in Part 1, for the manipulated implicit theory. There was no main effect of trait implicit theory of emotion, nor was there an interaction between trait EMS and valence, or trait EMS and instruction. When both trait EMS and manipulated implicit theories of emotion were included in the analyses, the interaction between manipulated implicit theory and instruction remained significant, $F(1,89) = 4.48$, $p = .04$ (see Figure 3.2), as did the main effect of valence. The main effect of trait implicit theories of emotion was not significant.

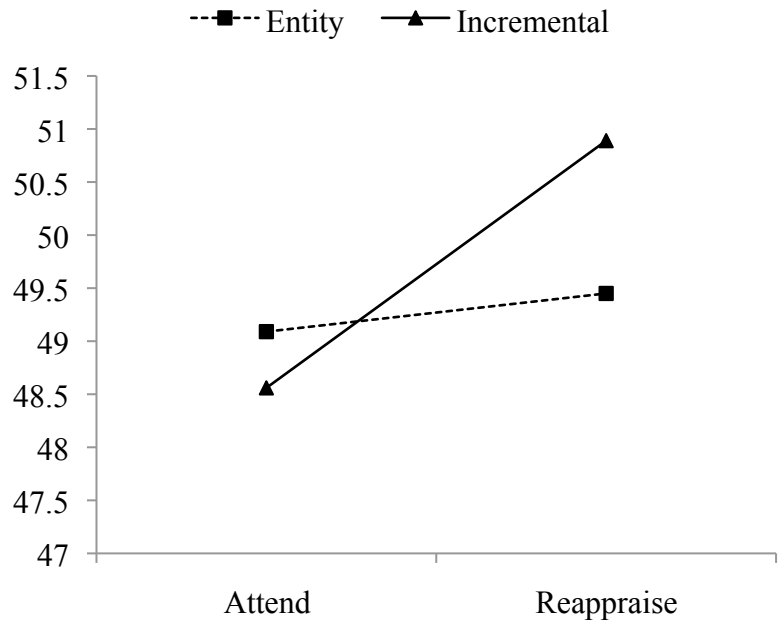


Figure F1. Interaction between manipulated implicit theory of emotion and regulation instructions, controlling for trait implicit theories of emotion (values shown at mean of EMS).

Individual Differences as Covariates

The Big Five personality traits, impulse strength, cognitive reappraisal, locus of control, and implicit theories of intelligence were each entered into the repeated measures

ANOVA as covariates with manipulated implicit theories of emotion predicting affect ratings in instructions x valence conditions. None of the covariates changed the pattern of results. In all cases, there were significant main effects of valence and instruction, a significant interaction between valence and instruction, and the hypothesized interaction between instruction and theory. There were, however, significant main effects of extraversion, neuroticism, openness, and cognitive reappraisal with higher extraversion, lower neuroticism, higher openness, and more reappraisal predicting higher affect ratings.

Conscientiousness, agreeableness, cognitive reappraisal, and implicit theories of intelligence interacted with valence. More conscientious people and people with incremental theories of intelligence rated negative pictures more negatively, and positive pictures more positively, compared to less conscientious people and entity intelligence theorists. The two were correlated, however, and the effect seemed to be driven by conscientiousness (implicit theories of intelligence did not significantly interact with valence after controlling for conscientiousness). More agreeable people rated positive pictures more positively than less agreeable people. People who reappraised more often rated neutral and positive pictures more positively than people who reappraised less often.

Individual Differences as Moderators

Each of the individual difference measures listed above was entered into the repeated measures ANOVA, along with an interaction term between the individual difference measure and manipulated implicit theories of emotion. In all cases, the main effects of valence and instruction, and the interactions between valence and instruction, and manipulated implicit theory of instruction, were significant. The only individual

difference that interacted with the manipulation was that there was a marginally significant interaction between extraversion and manipulated implicit theories of emotion (p = .08). Given the number of analyses conducted, however, this may be a spurious finding. The interaction is presented in Figure F2.

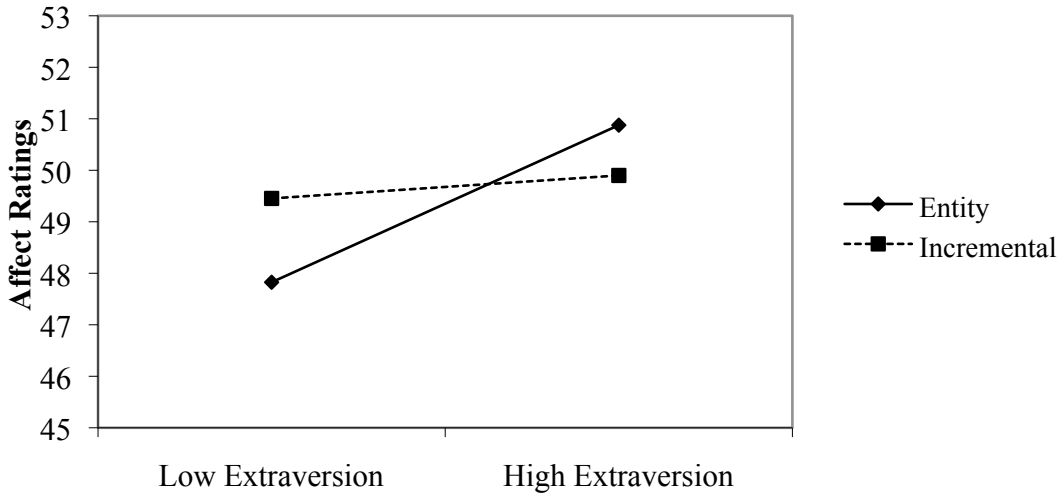


Figure F2. Interaction between BFI Extraversion and experimentally manipulated implicit theories of emotion.

Three-Way Interaction Results

The results of the three-way interaction between manipulated implicit theories, picture valence, and instructions are presented in Figure F3. The two plots show the same pattern: In both cases, the line representing the reappraise condition is flatter than the one representing the attend condition, indicating that ratings of positive and negative pictures were less intense when participants were told to remain objective.

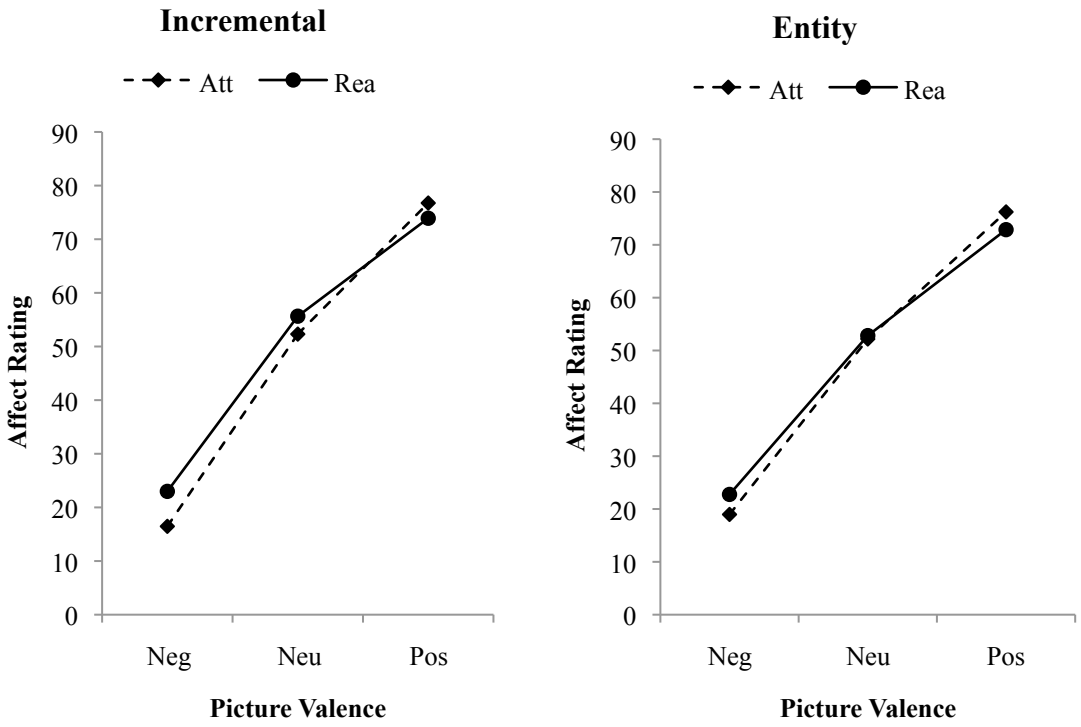


Figure F3. Theory x Instruction x Valence Three Way Interaction (nonsignificant)

I also analyzed the implicit theory by instruction interaction for each of the picture valences separately. When analyzing only the negative images, the main effect of instruction was significant, $F(1,91) = 16.64$, $p < .001$. The instruction x theory interaction was nonsignificant, $F(1,91) = 1.20$, $p = .28$. When analyzing the positive pictures only, the main effect of instruction was significant, $F(1,91) = 7.31$, $p < .001$. The instruction x theory interaction was nonsignificant, $F(1,91) = .05$, $p = .83$. When analyzing the neutral images only, the main effect of instruction was significant, $F(1,91) = 8.78$, $p = .004$. The instruction x theory interaction was significant, $F(1,91) = 4.01$, $p < .05$ (see Figure F4).

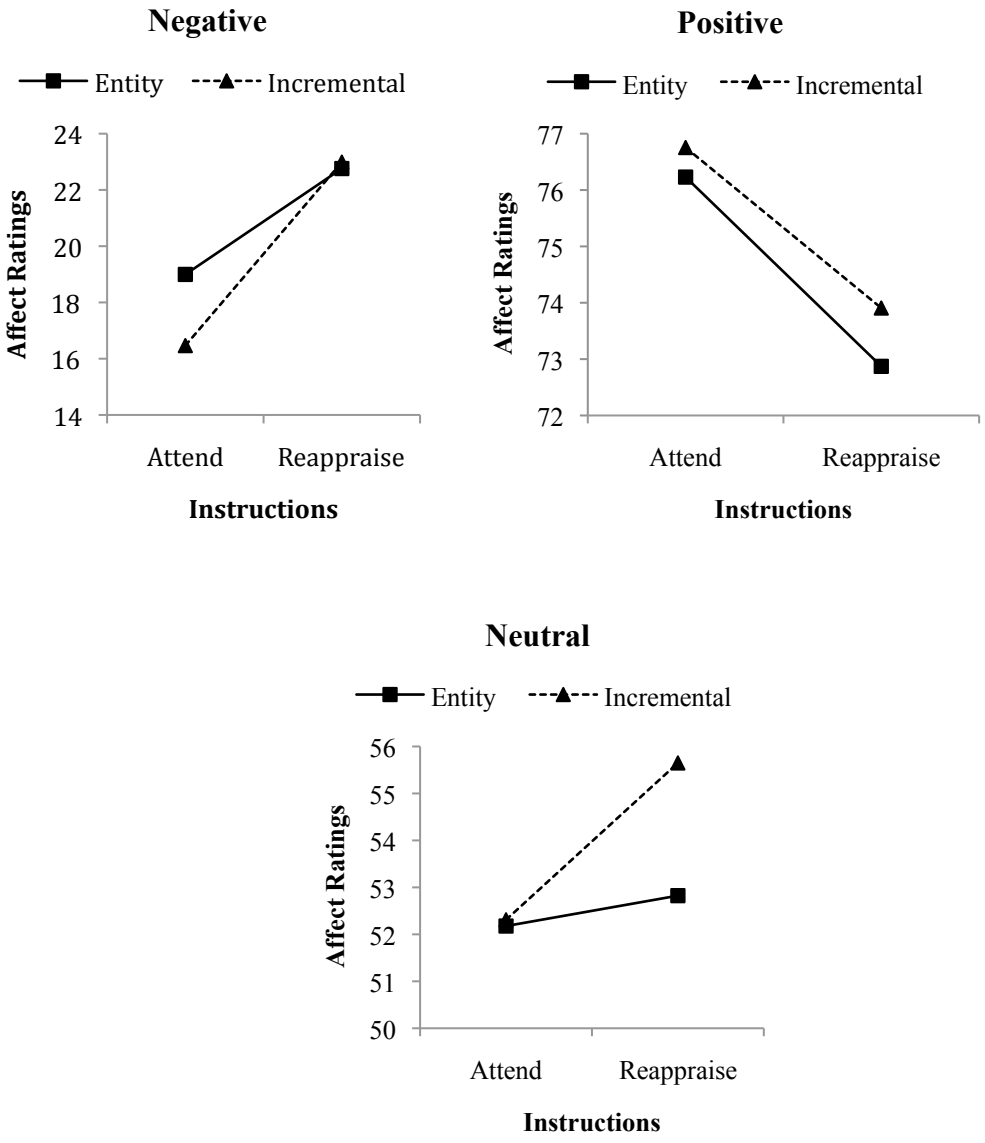


Figure F4. Interaction between implicit theory manipulation and instructions for images by valence.

APPENDIX G

FEEDBACK STIMULUS FOR STUDY 4

(next page)

Dot-Probe Performance

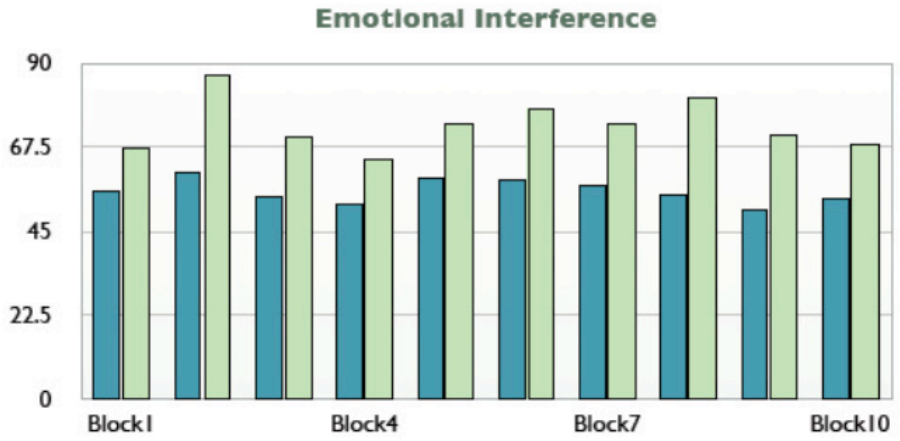
NOTES

Bar Graph:
Mean delay in reaction time per block of IAPS images. Block defined as a set of 30 images.

Raw Data Table:
Mean delay in reaction time (in milleseconds) between onset of stimulus (dot) and response (L/R). Higher score indicates greater interference of emotional information in cognitive processing and motor control.

Comparison Table:
Mean delay in reaction time (in milliseconds) broken down by valence of stimuli. Positive and Negative blocks are averaged into an "Emotional Stimuli" score, and are subtracted from the neutral baseline condition.

Control Performance:
Provides percentage ranking of emotional control performance, and diagnosis as
- well above average (very low emotional interference)
- above average (low emotional interference)
- average
- below average (high emotional interference)
- well below average (very high emotional interference)



Average Delay (ms)

	AVERAGE	STB425
Block1	55.63	67.10
Block2	60.74	86.75
Block3	54.00	69.98
Block4	52.11	64.32
Block5	58.89	73.55
Block6	58.66	77.79
Block7	57.01	73.42
Block8	54.39	80.40
Block9	50.44	70.48
Block10	53.82	68.03
Average	**55.57**	**73.18**

Comparison Table

	AVERAGE	STB425
Positive	55.82	78.03
Negative	57.47	80.41
Neutral	53.01	60.54
Difference	**3.20**	**29.88**

Control Performance

	PERCENTILE	
Average	50	--
Subject	27	below average

APPENDIX H

FEEDBACK SCRIPT FOR STUDY 4

This printout shows how you did on the dot-probe task. This task measures how much emotions interfere with your cognitive processing. In other words, the better you are at controlling your emotions, the more quickly you can perform the task. It's not so much about getting things right, but about how quickly you make your response. Differences are small- usually just a couple milliseconds, but they can have big implications. People who do well on this test tend to have better interpersonal relationships and are generally more successful in life.

Let's see how you did: So remember that this task measures reaction time. The more quickly you respond, the less emotional interference you show. Slower responses mean that your emotional interference score is higher. This bar graph shows your reaction times across the blocks of pictures [pointed to the higher bars]. You can see that they were a little above average [pointed to the lower bars].

You can see your reaction times for each block here [pointed to the big table], and over here it's broken down by the tone of the picture [pointed to comparison table]. Down here you see your percentage- you scored in the 27^{th} percentile of all the people who have completed this task, which means that your emotional interference score is relatively high. [gave them a couple seconds to look it over, and answer any questions they might have, but do not give away the hypothesis.] Are you all set with this? [put away the feedback and had them sit at the computer.]

APPENDIX I

FOLLOW-UP ANALYSES FOR STUDY 4

Individual Differences in Implicit Theories of Emotion

I examined correlations between trait implicit theories of emotion, measured before participants came in to the lab, and the dependent variables—attributions, affect, and task preference. There were no significant correlations with trait implicit theories of emotion. When entering trait implicit theory of emotion as a covariate into the ANOVA models, the pattern of significance remained the same: Attributions for ability and strategy were both significantly higher in the incremental condition, and attribution for effort was marginally higher in the incremental condition. Participants in the incremental condition also preferred to engage in the unrelated task, compared to participants in the entity condition, and had a marginally higher preference for the unrelated task, regardless of trait implicit theory.

When the interaction between trait and manipulated implicit theories of emotion was added, there were no significant interactions between trait and manipulated implicit theory of emotion, though the interaction was marginally significant in predicting attribution for strategy ($p = .07$). In all cases for the dependent variables of positive and negative affect, and attributions to ability, effort, and strategy, and task preference, the group differences between manipulated entity and incremental conditions remained significant. The manipulated implicit theory of emotion group differences on effort attributions and task preference were marginally significant, as it was in the original analysis.

Individual Difference Covariates

The Big Five personality traits, emotional impulse strength, trait cognitive reappraisal, locus of control, and implicit theories of intelligence were each entered as covariates in predicting the dependant measures that were either significant or marginally significant (i.e., attributions to ability, effort, and strategy, preference for the unrelated task, and preference for the remedial tutorial over the unrelated task). In all cases, the pattern of significance did not change when individual differences were entered as covariates (i.e., the group differences that were statistically significant remained statistically significant, $p < .05$, and the group differences that were marginally significant remained marginally significant, $p < .08$). In the case of attributions to strategy, there were marginally significant main effects of openness and conscientiousness, but the main effects of manipulated implicit theory remained significant.

Dot Probe Results

The attentional probe task was designed to serve as a plausible measure of "emotional interference" for the participants, and group differences were not hypothesized a priori. Because past research has shown attentional biases in certain populations such as clinically anxious and depressed (e.g., Mogg & Bradley, 2005), however, I tested for any group differences in attentional biases that may have emerged due to implicit theories of emotion.

Trials including incorrect responses, as well as trials in which a participant's reaction time was greater or less than 3 SD's from that participant's mean, were excluded from analyses. Errors accounted for 1.2% of all trials, and outliers accounted for 1.4%.

Attentional bias was calculated as the difference between incongruent trials (in which the dot is in the neutral location) and the congruent trials (in which the dot is in the emotional location). Bias scores were calculated separately for positive and negative blocks, as well as collapsing across all emotional trials, which yielded a general bias score. Calculated this way, a bias toward emotional stimuli is represented as a positive score (above zero), and a bias toward neutral stimuli is represented as a negative score (below zero).

Experimental Conditions

Participants in the entity condition did not significantly differ from participants in the incremental condition in their general attentional bias, or in their biases toward positive or negative stimuli. Entity participants (M = 1.79, SD = 2.14) made significantly more errors than incremental participants (M = 1.05, SD = 1.20), $t(90) = -2.04$, $p < .05$. Mean reaction times are presented in Table I1. Mean bias scores are presented in Table I2 and in Figure I1.

Table I1. Mean reaction times (in milliseconds) of entity and incremental groups

	Positive-Neutral		Negative-Neutral		Total	
	Dot in positive location	Dot in neutral location	Dot in negative location	Dot in neutral location	Dot in emotion location	Dot in neutral location
Entity	228 (43)	229 (41)	240 (49)	242 (46)	234 (45)	235 (42)
Incremental	233 (38)	236 (38)	252 (48)	243 (48)	243 (42)	244 (43)
Total	230 (40)	232 (40)	246 (48)	247 (47)	239 (43)	239 (42)

Note. Standard deviations (in milliseconds) are presented in parentheses.

I conducted a 2 (theory) x 2 (valence) ANOVA to see if there was an interaction. The main effect of theory was nonsignificant, $F(1,90) = .01$, $p = .91$, as was the main effect of valence, $F(1,90) = .68$, $p = .41$. The interaction between the two variables was nonsignificant as well, $F(1,90) = 1.74$, $p = .19$ (see Figure I1).

Table I2. Biases toward emotional stimuli as a function of implicit theory of emotion group

Bias	Entity	Incremental	*t*	*p*	*d*
General bias toward emotional stimuli	1.00 (10.31)	.66 (14.05)	-.13	.89	.03
Bias toward negative stimuli	1.76 (15.04)	-1.00 (17.18)	-.82	.41	.17
Bias toward positive stimuli	.83 (13.17)	3.05 (15.32)	.75	.46	-.16
N	48	44			

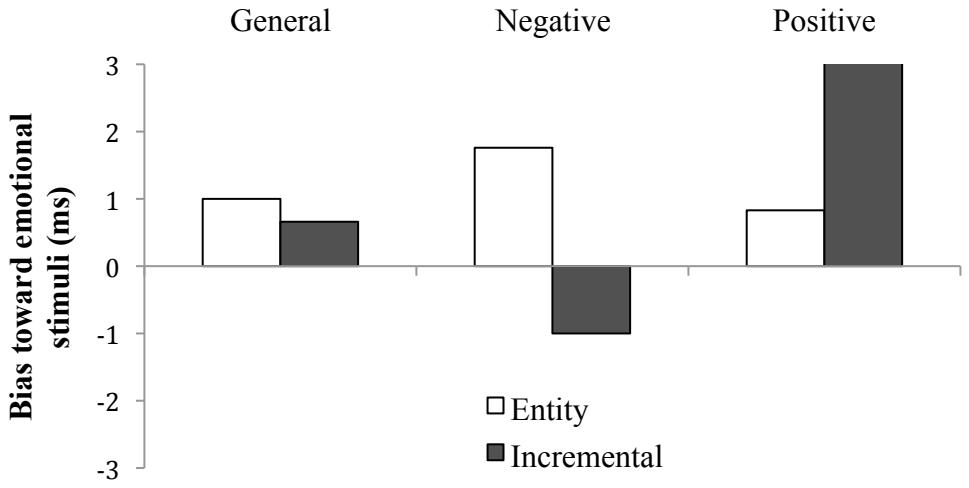


Figure I1. Attentional bias towards emotional stimuli.

Individual Difference Measures and Dot Probe Performance

To examine the role of individual differences in attentional bias towards emotional stimuli, I correlated general, negative, and positive attentional bias scores with the individual difference scores measured in Part 1 (see Table 4.6). General attentional bias was strongly correlated with both negative bias ($r = .83$, $p < .001$) and positive bias ($r = .77$, $p < .001$), although the correlation between positive and negative biases was modest ($r = .28$, $p = .006$).

Table I3. Correlations between individual difference measures and attentional bias toward emotional stimuli.

	Overall Attentional Bias	Negative Attentional Bias	Positive Attentional Bias
Implicit theories of emotion	-.11	-.22*	.06
Impulse Strength	.10	-.04	.21*
BFI Extraversion	-.17	-.13	-.13
BFI Neuroticism	.30*	.17	.32*
BFI Openness	.02	.05	.00
BFI Conscientiousness	-.06	-.13	.05
BFI Agreeableness	-.10	-.15	-.01
ERQ Reappraisal	-.25*	-.24*	-.17
ERQ Suppression	.04	.02	.03
Implicit theories of intelligence	-.09	-.21*	.09

* $p < .05$.

Implicit theories of emotion ($r = -.22$, $p = .04$) and implicit theories of intelligence ($r = -.21$, $p = .04$) were both related to weaker attentional bias toward negative stimuli. When entered simultaneously into a regression neither intelligence theories ($B = -.11$, $SE = .07$) nor emotion theories ($B = -.22$, $SE = .13$) were significant, $t(89) = -1.58$, $p = .12$ for intelligence and $t(89) = 1.67$, $p = .10$ for emotion. The two implicit theories were correlated at $r = .26$, $p = .01$.

Participants who scored higher on trait neuroticism showed greater attentional biases toward emotional stimuli ($r = .30$, $p = .003$) and to positive emotional stimuli ($r = .32$, $p = .002$). Neuroticism did not significantly predict greater bias toward negative stimuli ($r = .17$, $p = .11$), although the effect was in the same direction. Participants who scored higher on trait cognitive reappraisal showed smaller attentional biases toward emotional stimuli ($r = -.25$, $p = .01$) and negative emotional stimuli ($r = -.24$, $p = .02$). Reappraisal did not significantly predict less bias towards positive stimuli ($r = -.17$, $p = .11$), although the effect was in the same direction.

Attribution Factors

I examined whether there was one dimension or several along which the attributions vary (e.g., the degree to which the variable is controllable, global, and/or stable). I therefore factor analyzed the 10 attributions, first for the entire sample, and then separately for those in the entity and incremental conditions. Mood, luck, and understanding of instructions did not load well on any of the factor solutions examined, and so were removed from analyses. I performed exploratory factor analysis using oblique rotation (Oblimin) on attributions to ability, effort, interest, task familiarity, task difficulty, concentration, and strategy. Factor loadings are presented in Table I4, and the correlations between factor scores and the dependent variables (affect and motivation) are presented in Table I5.

Table I4. Factor loadings of attributions for whole sample

Attribution	Factor Loading	Mean (SD)
Ability	.70	37.09 (28.47)
Effort	.77	37.64 (30.13)
Interest	.65	43.41 (25.78)
Concentration	.66	57.42 (29.22)
Strategy	.56	40.38 (31.35)
Familiarity	.54	33.24 (29.59)
Difficulty	.53	22.25 (25.67)

Table I5. Correlations between attribution factor score and dependent variables.

	Correlations		
	All	Incremental	Entity
Negative Affect	.06	.23	-.08
Positive Affect	.14	.00	.23
Interest in emotion tutorial	.21*	.00	.38*
Interest in unrelated task	.16	.00	.19
Emotion over unrelated	.03	.00	.14
N	92	44	48

* $p < .05$.

I also examined the factor structure separately for entity and incremental groups. The factor structure in the entity subsample was a single factor that had loadings similar to the sample as a whole (see Table I6). Of the correlations, only the tendency to make attributions was significantly correlated with any of the other dependent variables: interest in the emotional tutorial.

Table I6. Factor loadings and correlations for entity condition

	Factor Loading
Ability	.82
Effort	.79
Concentration	.75
Interest	.71
Difficulty	.61
Familiarity	.56
Strategy	.51
	Correlations
Negative Affect	-.09
Positive Affect	.22
Interest in emotion tutorial	.35*
Interest in unrelated task	.19
Emotion over unrelated	.11

The factor analysis for the incremental group yielded a two-factor structure (see Table I7). An initial interpretation of these two factors is person-oriented (Factor 1) vs. task-oriented (Factor 2). Effort, interest, ability, and concentration are variables related to the person engaging in the task, whereas task familiarity, task difficulty, and strategy are variables related to the task itself, or the person's engagement with the particular task. Neither of the factor scores correlated significantly with affect of motivation. For entity participants, these variables all loaded onto a single factor. That is, entity participants seemed to vary on their tendency to make attributions, whereas incremental participants

seemed to differ on the extent to which they made attributions to both person- and task-oriented attributions.

Table I7. Factor loadings (pattern matrix) and correlations for incremental condition

	Factor Loadings	
	Factor 1	Factor 2
Effort	.79	-.08
Interest	.69	.03
Ability	.61	.00
Concentration	.58	.02
Familiarity	-.03	-.86
Difficulty	-.03	-.79
Strategy	.07	-.67
	Correlations	
Negative Affect	.16	-.20
Positive Affect	-.13	-.24
Interest in emotion task	-.12	-.19
Interest in unrelated task	.06	.13
Emotion over unrelated	-.14	-.25
Factor 1	--	-.32

Note. None of the correlations between attribution factors and other dependent variables were significant.

When these two factors were scored for the entire sample, incremental participants were more likely to make attributions to self-related factors ($M = 48.98$, $SD = 21.34$), compared to entity participants ($M = 39.32$, $SD = 23.67$), $t(89) = 2.04$, $p < .05$. Incremental participants were also marginally more likely to make attributions to task-related factors ($M = 36.24$, $SD = 24.99$) compared to entity participants ($M = 28.13$, $SD = 21.38$), $t(89) = 1.67$, $p = .10$.

In a 2 (attribution) x 2 (theory) repeated measures ANOVA, there was a main effect of attribution, such that people were more likely to make attributions to self factors ($M = 43.89$, $SD = 22.99$) than to task factors ($M = 31.96$, $SD = 23.38$), $F(1,89) = 22.52$, $p < .001$. There was also a significant main effect of theory, such that incremental

participants were more likely to stronger attributions, $F(1,89) = 5.73$, $p = .03$. but there was no interaction with implicit theory manipulation, $F(1,89) = .09$, $p = .76$.

Ipsatized Attributions

Participants in the incremental condition showed a tendency to make higher attribution ratings on average, compared to those in the entity condition, which could represent an acquiescence bias. I therefore ipsatized attribution scores, which utilizes z-scores instead of raw scores, and controls for acquiescence. Results are presented in Table I8.

Table I8. Ipsatized attribution scores for entity and incremental groups.

	Entity	Incremental	*t*	*p*	*d*
Ability	-.04 (.72)	.17 (.84)	1.31	.20	**.27**
Effort	-.05 (.89)	.20 (.77)	1.42	.16	**.30**
Mood	.28 (1.09)	.05 (.92)	-1.12	.27	**-.23**
Interest	.38 (.78)	.28 (.74)	-.65	.52	-.13
Concentration	.86 (.79)	.84 (.78)	-.10	.92	-.03
Strategy	.05 (.93)	.31 (.80)	1.43	.16	**.30**
Familiarity	-.11 (.82)	.05 (.90)	.87	.39	.19
Task difficulty	-.36 (.73)	-.57 (.59)	-1.49	.14	**-.32**
Luck	-.91 (.70)	-1.09 (.68)	-1.24	.22	**-.26**
Instructions	-.11 (.98)	-.24 (1.03)	-.63	.53	-.13
N	48	43			

Note. Effect sizes greater than .20 are in bold.

There were no significant differences in ipsatized attributions between entity and incremental participants, *p*'s = .14 to .92. There were, however, small effect sizes, such that those in the incremental condition were relatively more likely to attribute emotion regulation failure to ability ($d = .27$), effort ($d = .30$), and strategy ($d = .30$), whereas those in the entity condition were relatively more likely to attribute emotion regulation failure to mood ($d = -.23$), task difficulty ($d = -.32$), and luck ($d = -.26$). When attribution

scores were centered on the person (i.e., the person's mean attribution score was subtracted from each item), the pattern was the same (see Table I9). In both cases, however, the effect sizes were small and statistically nonsignificant (see table at end of chapter). One option for future research would be to have participants assign weights to the various factors, allowing them to distribute 100% of their performance among the variables that most influenced their performance.

Table I9. Person-centered attributions (personal mean subtracted from attribution)

	Entity	Incremental	*t*	*p*	*d*
Ability	-.04 (.72)	.24 (.93)	1.65	.10	**.34**
Effort	.02 (.77)	.22 (.90)	1.14	.26	**.23**
Mood	.25 (1.17)	-.01 (1.07)	-1.14	.27	**-.23**
Interest	.38 (.71)	.31 (.84)	-.37	.71	-.09
Concentration	.85 (.80)	.97 (.98)	.59	.55	.13
Strategy	.08 (.99)	.38 (.93)	1.49	.14	**.31**
Familiarity	-.13 (.84)	.01 (.98)	.71	.48	.15
Task difficulty	-.40 (.75)	-.61 (.79)	-1.36	.18	**-.27**
Luck	-.92 (.76)	-1.20 (.82)	-1.70	.09	**-.35**
Instructions	-.10 (.94)	-.31 (1.15)	-.96	.34	**-.20**
N	48	43			

Note. Scores reflect original scale (1-5) rather than the rescaled 1-100.

Inferential Statistics, Controlling for Persuasiveness

In the manipulation check, incremental participants rated the article as more persuasive than the entity participants. I therefore ran the analyses presented in Study 4 using persuasiveness as a covariate. The pattern of results did not change (see Table I10).

Table I10. Inferential statistics, controlling for manipulation persuasiveness.

	Entity	Incremental	*F*	*p*
Attribution:				
Ability	2.26 (1.12)	2.73 (1.07)	4.48	.04
Effort	2.35 (1.16)	2.73 (1.25)	3.11	.08
Mood	2.50 (1.26)	2.53 (1.19)	.00	.99
Interest	2.61 (1.04)	2.83 (1.05)	1.42	.24
Concentration	3.09 (1.21)	3.51 (1.14)	3.14	.08
Strategy	2.37 (1.27)	2.98 (1.19)	4.00	.05
Familiarity	2.11 (1.08)	2.56 (1.29)	4.04	.05
Task Difficulty	1.91 (1.03)	1.90 (1.07)	.01	.91
Luck	1.35 (.57)	1.34 (.73)	.04	.85
Instructions	2.15 (1.10)	2.17 (1.43)	.09	.76
Affect				
Positive	25.82 (15.29)	31.01 (18.64)	1.59	.21
Negative	9.24 (7.65)	9.70 (8.84)	.17	.68
Motivation				
Interest in tutorial	2.83 (.95)	3.02 (1.12)	.17	.68
Interest in other task	2.24 (1.04)	2.85 (1.20)	4.99	.03
N	46	41		

Note: attributions and motivation are reported in the original 1-5 scale.

APPENDIX J

FEEDBACK STIMULUS FOR STUDY 5

(next page)

Dot-Probe Performance

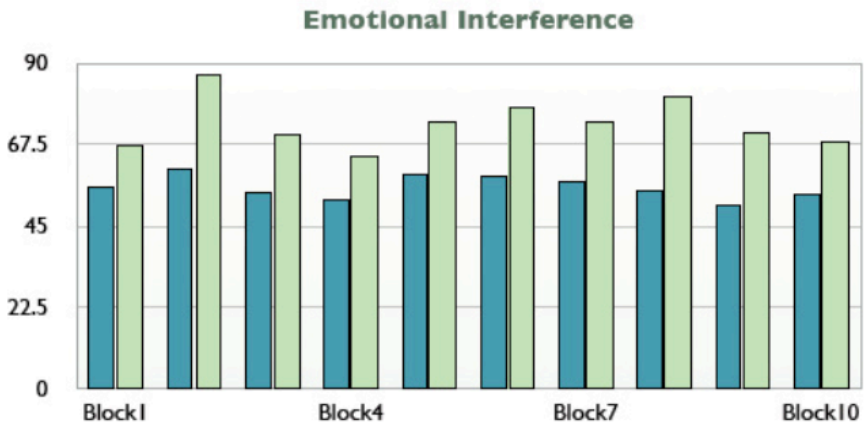
NOTES

Bar Graph:
Mean delay in reaction time per set of IAPS images. ImgSt (Image Set) defined as a set of 30 images.

Raw Data Table:
Mean delay in reaction time (in milleseconds) between onset of stimulus (dot) and response (L/R). Higher score indicates greater interference of emotional information in cognitive processing and motor control.

Comparison Table:
Mean delay in reaction time (in milliseconds) broken down by valence of stimuli. Positive and Negative blocks are averaged into an "Emotional Stimuli" score, and are subtracted from the neutral baseline condition.

Control Performance:
Provides percentage ranking of emotional control performance, and diagnosis as
•well above average (very low emotional interference)
•above average (low emotional interference)
•average
•below average (high emotional interference)
•well below average (very high emotional interference)



Average Delay (ms)

	STB425B	STB425D
Block1	55.63	67.10
Block2	60.74	86.75
Block3	54.00	69.98
Block4	52.11	64.32
Block5	58.89	73.55
Block6	58.66	77.79
Block7	57.01	73.42
Block8	54.39	80.40
Block9	50.44	70.48
Block10	53.82	68.03
Average	**55.57**	**73.18**

Comparison Table

	STB425B	STB425D
Positive	55.82	78.03
Negative	57.47	80.41
Neutral	53.01	60.54
Difference	**3.20**	**29.88**

Control Performance

	PERCENTILE	
STB425_B	81	above average
STB425_D	27	below average

APPENDIX K

FEEDBACK SCRIPT FOR STUDY 5

This printout shows how you each did on the dot-probe task. This task measures how much emotions interfere with your cognitive processing. In other words, the better you are at controlling your emotions, the more quickly you can perform the task. It's not so much about getting things right, but about how quickly you make your response.

Let's see how you did: Slower responses mean that your emotional interference score is higher. This bar graph shows your reaction times across three blocks of pictures [point to the bar graph]. [indicated the person in the success feedback condition] You did pretty well- your bars are low, which means that your reaction time was pretty good. [indicated the person in the failure feedback condition] Your scores were a little slower. This suggests that you were slower to respond when the pictures were emotional.

You can see your reaction times for each set of pictures here [pointed to the big table], and over here it's broken down by the tone of the picture [pointed to comparison table]. Down here you see your percentage- you [indicated success feedback participant] scored in the 81st percentile of all people who completed this task, which means that your emotional interference score is lower than most people's. You [indicated failure feedback participant] scored in the 27th percentile of all the people who have completed this task, which means that your emotional interference score is higher than most people's. [gave them a couple seconds to look it over, and answered any questions they might have, but did not give away the hypothesis.] Do you have any questions? [put away the feedback and have them sit back down at their computers.]

Now you will be completing a couple of additional tasks. First, we have a couple of questions regarding the task you just completed. Then, you get one more shot at the emotional interference task. This will take about [filled in about as much time as is left in the session], and then you're done.

APPENDIX L

FOLLOW-UP ANALYSES FOR STUDY 5

Trait Implicit Theories of Emotion

I examined correlations between trait implicit theories of emotion, measured before participants came in to the lab, and the dependent variables—attributions, affect, and motivation after feedback. Analyses were conducted separately for success and failure feedback.

Success Feedback

Implicit theory of emotion was significantly correlated to positive affect after receiving success feedback, such that stronger incremental theorists reported higher positive affect ($r = .31$, $p = .02$) and also reported putting forth more effort in the second round ($r = .26$, $p < .05$). Incremental participants were also marginally more likely to attribute their success to their ability ($r = .24$, $p = .07$).

Failure Feedback

Implicit theory of emotion was not significantly related to any of the dependent measures after receiving failure feedback, though this may be due to low power. An incremental theory was nonsignificantly related to stronger attributions to understanding of the instructions ($r = .21$, $p = .11$), to positive affect ($r = .21$, $p = .13$), and to self-perceived performance on the second round of the emotional interference task ($r = .20$, $p = .14$), as well as to mood after the second round ($r = .21$, $p = .11$).

Trait Implicit Theories of Emotion as a Covariate

For covariate analyses, trait implicit theories were entered as a covariate into the 2 (manipulated implicit theory) x 2 (feedback condition) ANOVA. When controlling for

trait implicit theory of emotion, all of the 2 x 2 analyses reported above maintained the same level of significance. In addition, there were some main effects of trait implicit theory. Incremental theorists were higher on attributions to ability, $F(1,109) = 5.58$, $p = .02$, attributions to effort, $F(1,109) = 3.56$, $p = .06$, and on self-perceived performance on the second round of the emotional interference task, $F(1,109) = 6.70$, $p = .01$.

Trait Implicit Theories of Emotion as a Moderator

For moderation analyses, manipulated implicit theory and manipulated feedback were entered as between-subjects factors, and trait implicit theories was entered as a covariate, along with the interactions between trait implicit theories and manipulated implicit theories and between trait implicit theories and manipulated feedback.

Trait implicit theories of emotion moderated the effect of failure vs. success feedback on effort put forth in the second round of the emotional interference task: There was a main effect of feedback, $F(1,107) = 31.39$, $p < .001$, and a significant interaction between feedback and trait implicit theories of emotion, $F(1,107) = 5.46$, $p = .02$ (See Figure L1).

When controlling for trait implicit theories of emotion, there was a marginal interaction between manipulated implicit theory and feedback, $F(1,107) = 3.54$, $p = .06$. There were no other significant interactions with trait implicit theories of emotion, and the pattern of significance found in the original analyses remained the same.

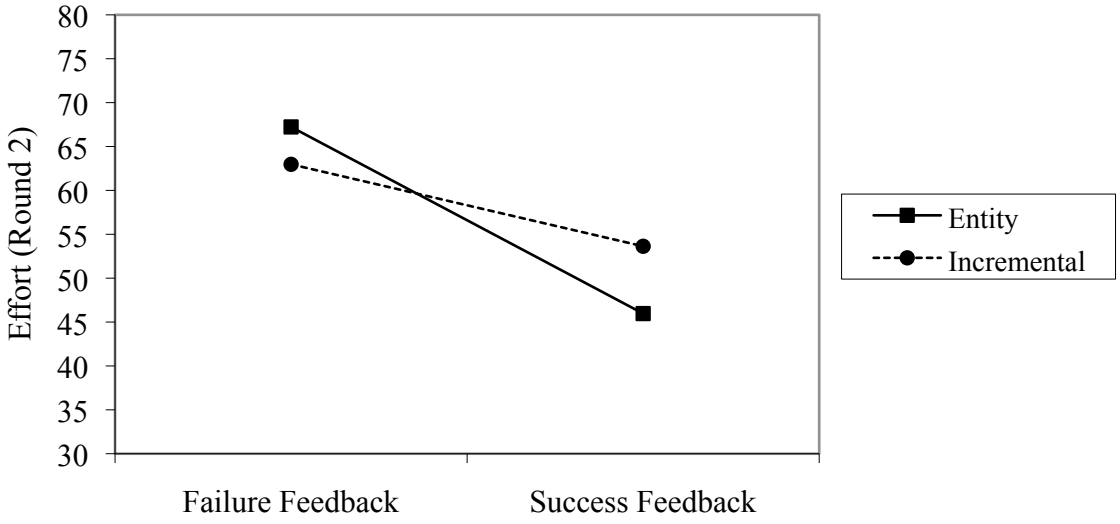


Figure L1. Interaction between trait implicit theories of emotion and feedback.

Trait Implicit Theories and the Dot Probe Task

Trait incremental theory was significantly correlated with a general tendency to attend to emotional stimuli over neutral stimuli, $r = .20$, $p = .03$, but was uncorrelated with any of the other biases. In a repeated measures ANOVA with trait EMS as a predictor and general emotional bias as the dependent variable, there was a main effect of trial round, such that bias tended to decrease from trial 1 ($M = 1.67$, $SD = 41.17$) to trial 2 ($M = 1.24$, $SD = 12.50$), $F(1,112) = 4.11$, $p < .05$. There was also a significant interaction between trial round and EMS, $F(1,112) = 4.40$, $p = .04$. For tendency to attend to positive stimuli over neutral stimuli, there was a main effect of trial, such that people generally shifted from a bias towards neutral stimuli ($M = -5.02$, $SD = .69$) to a bias towards positive stimuli ($M = 4.08$, $SD = .19$), $F(1,112) = 4.46$, $p = .04$. There was also a marginal interaction between trial round and trait EMS, $F(1,112) = 3.52$, $p = .06$. There were no effects of trait EMS or time on bias toward negative stimuli over neutral stimuli.

Individual Differences in the Dot Probe Task

To examine the role of individual differences in attentional bias towards emotional stimuli, I correlated general, negative, and positive attentional bias scores with the individual difference scores measured in Part 1 (see Table L1). Although round 1 contained only a small number of trials (15 each for positive-neutral and negative-neutral pairings), neuroticism was correlated with greater attention to negative over neutral stimuli (r = .22, p = .02), and conscientiousness was correlated with greater attention to neutral over negative stimuli (r = -.22, p = .02). As in Study 4, agreeableness was correlated with greater attention to positive over neutral stimuli (r = .21, p .03). Implicit theories of emotion were related to bias, such that a higher incremental theory predicted greater attention to positive over neutral stimuli (r = .19, p < .05), and greater attention to emotional over neutral stimuli (r = .20, p = .03). In Round 2, there were no significant differences between individual difference measures and attentional bias, suggesting that the feedback manipulation overpowered the influence of any stable individual differences.

Table L1. Correlations between individual difference measures and attentional bias.

	Round 1 Attentional Bias		
	Overall	Negative	Positive
Implicit theories of emo.	.20*	.04	.19*
Impulse Strength	.07	.12	.02
BFI Extraversion	.04	-.07	.07
BFI Neuroticism	.03	.22*	-.07
BFI Openness	.10	-.08	.15
BFI Conscientiousness	.00	-.22*	.10
BFI Agreeableness	.15	-.09	.21*
ERQ Reappraisal	-.05	-.11	-.01
ERQ Suppression	.10	.12	.04
Implicit theories of intelligence	.15	.01	.16

Table L1 (continued). Correlations between individual difference measures and attentional bias.

	Round 2		
	Overall	Negative	Positive
Implicit theories of emotion	-.05	-.05	-.02
Impulse Strength	.07	.00	.09
BFI Extraversion	.01	-.07	.09
BFI Neuroticism	.01	-.06	.05
BFI Openness	-.15	-.17	-.07
BFI Conscientiousness	-.01	-.11	.07
BFI Agreeableness	-.02	-.07	.03
ERQ Reappraisal	-.09	-.09	-.07
ERQ Suppression	.04	.08	-.01
Implicit theories of intelligence	-.04	-.07	.00

* $p < .05$.

Attribution Factor Analysis

As in Study 4, I examined the factor structure of attributions in the entire sample, as well as in the subsamples of entity, incremental, success, and failure conditions. In all subsamples, a single factor emerged. Factor loadings differed slightly from subsample to subsample, however (see Table L2). Since no consistent structure emerged, and the factor structure differed from that in Study 4, I did not perform additional analyses.

Ipsatized Attributions

The tendency of incremental participants to make more attributions than entity participants was not as pronounced in Study 5 as in Study 4. To perform parallel analyses, however, I ipsatized attribution scores in this sample, and examined any differences between conditions. Descriptive statistics are presented in Table L3, and inferential statistics are presented in Table L4.

Table L2. Factor loadings of attributions in entire sample and subsamples.

	Condition				
Attribution	All	Entity	Incremental	Success	Failure
Effort	.73	.68	.76	.80	.52
Instructions	.70	.66	.73	.68	.57
Interest	.68	.78	.62	.68	.52
Concentration	.63	.54	.68	.57	.72
Strategy	.48	.55	.45	.36	.48
Difficulty	.48	.54	.45	.27	.62
Mood	.44	.41	.45	.48	.36
Ability	.43	.56	.35	.51	.27
Familiarity	.33	.36	.32	.11	.73
Luck	.06	-.10	.16	-.23	.40

Table L3. Descriptive statistics for ipsatized attribution scores

	Entity	Incremental	Total
Success feedback			
Ability	-.11 (.71)	.02 (.82)	-.03 (.78)
Effort	.33 (.55)	.28 (.73)	.30 (.66)
Mood	-.12 (.80)	-.14 (.73)	-.13 (.75)
Interest	.71 (.69)	.89 (.77)	.79 (.72)
Concentration	.16 (.73)	.06 (.82)	.10 (.78)
Strategy	.02 (.98)	.59 (.89)*	.36 (.96)
Familiarity	-.36 (.98)	-.57 (.75)	-.49 (.85)
Difficulty	.00 (.75)	-.07 (.96)	-.04 (.88)
Luck	-1.08 (1.08)	-1.17 (.83)	-1.13 (.93)
Instructions	.27 (.87)	.29 (.76)	.28 (.80)
N	23	34	57
Failure feedback			
Ability	.05 (.77)	.30 (1.15)	.15 (1.01)
Effort	-.18 (.89)	-.10 (.88)	-.13 (.88)
Mood	.06 (.99)	.16 (.96)	.12 (.96)
Interest	.44 (1.04)	.61 (.86)	.54 (.93)
Concentration	.57 (1.00)	.19 (.73)	.35 (.87)
Strategy	.03 (.84)	.31 (1.03)	.19 (.95)
Familiarity	.12 (.73)	-.02 (.85)	.04 (.80)
Difficulty	.11 (.87)	-.35 (.56)*	-.14 (.74)
Luck	-1.08 (.49)	-.95 (.62)	-1.00 (.57)
Instructions	-.04 (.95)	-.16 (.88)	-.11 (.90)
N	24	33	57

Table L3 (continued). Descriptive statistics for ipsatized attribution scores.

	Entity	Incremental	Total
Total			
Ability	-.08 (.73)	.16 (1.00)	.06 (.90)
Effort	.07 (.78)	.09 (.83)	.08 (.80)
Mood	-.03 (.90)	.01 (.86)	-.01 (.87)
Interest	.66 (.93)	.66 (.78)	.66 (.84)
Concentration	.37 (.89)	.13 (.78)	.23 (.83)
Strategy	.03 (.90)	.45 (.96)*	.28 (.96)
Familiarity	-.11 (.89)	-.30 (.84)	-.22 (.86)
Difficulty	.06 (.81)	-.21 (.80)	-.09 (.81)
Luck	-1.09 (.82)	-1.06 (.74)	-1.07 (.77)
Instructions	.11 (.92)	.08 (.86)	.09 (.87)
N	47	67	114

* $p < .05$.

Table L4. 2 (theory) x 2 (feedback) ANOVA results for ipsatized attribution scores

	Main Effect: Theory	Main Effect: Feedback	Theory x Feedback Interaction
Ability	.20	1.97	.1.03
Effort	.01	8.81*	.15
Mood	.05	2.16	.12
Interest	.00	3.01†	1.23
Concentration	2.23	3.06†	.82
Strategy	5.41*	.59	.66
Familiarity	1.22	10.85*	.05
Difficulty	2.96†	.31	1.60
Luck	.01	.60	.55
Instructions	.08	5.49*	.18

† $p < .08$. * $p < .05$.

There was a significant main effect of theory on attributions to strategy, such that incremental participants ($M = .45$, $SD = .96$) were relatively more likely to attribute their performance to strategy, compared to entity participants ($M = .03$, $SD = .90$), $F(1,110) = 5.41$, $p < .05$. There was also a marginal main effect of theory on attributions to difficulty, such that incremental participants were relatively less likely to attribute their

performance to task difficulty (M = -.21, SD = .80) compared to entity participants (M = .06, SD = .81), $F(1,110) = 2.96$, $p = .09$.

There were significant main effects of feedback on attributions to effort, familiarity, and instructions, and marginally significant effects of feedback on attributions to interest and concentration. People who received success feedback were relatively more likely to attribute their success to effort and understanding of instructions, and relatively less likely to attribute their success to familiarity. They were marginally more likely to make relatively stronger attributions to interest, compared to the failure group. People who received failure feedback were marginally more likely to attribute their failure to concentration.

Correlations between ipsatized attributions and affect and motivation are presented in table L5. People who made relatively stronger attributions to effort reported more positive affect, whereas people who made relatively stronger attributions to familiarity and luck reported less positive affect. People who made relatively stronger attributions to effort reported less negative affect, whereas people who made relatively stronger attributions to mood reported more negative affect. Attributions to familiarity were correlated with greater effort and greater persistence in the second round of dot probe trials.

Table L5. Correlations between ipsatized attributions, affect, and motivation

	Positive Affect	Negative Affect	Effort	Performance
Attributions				
Ability	-.05	.01	.06	.01
Effort	.25*	-.18†	-.07	-.16
Mood	.01	.18†	.15	.08
Interest	-.10	.02	-.11	.00
Concentration	.14	-.08	.12	.03
Strategy	.07	.02	-.10	-.17†
Familiarity	-.21*	.11	.25*	.23*
Difficulty	-.06	.00	-.15	-.04
Luck	-.22*	.09	-.06	.02
Instructions	.16	-.13	-.10	.00

† $p < .08$. * $p < .05$.

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